

Fig. 1.1

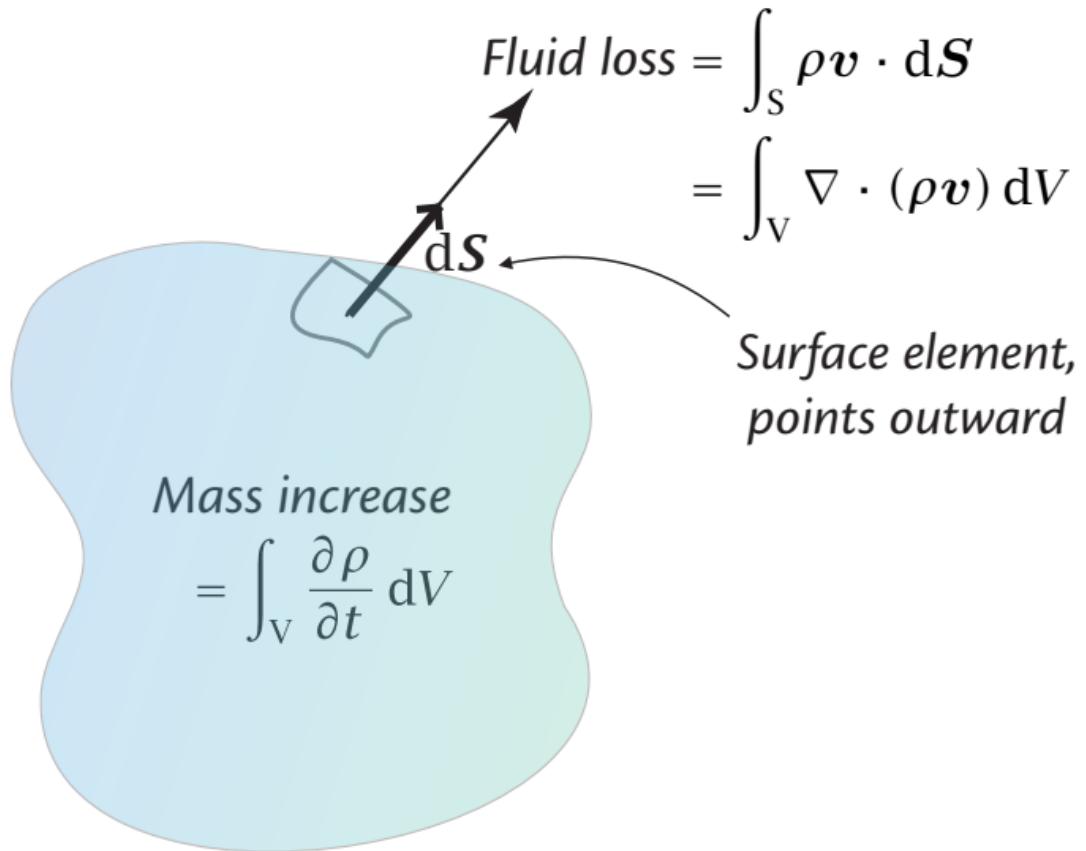
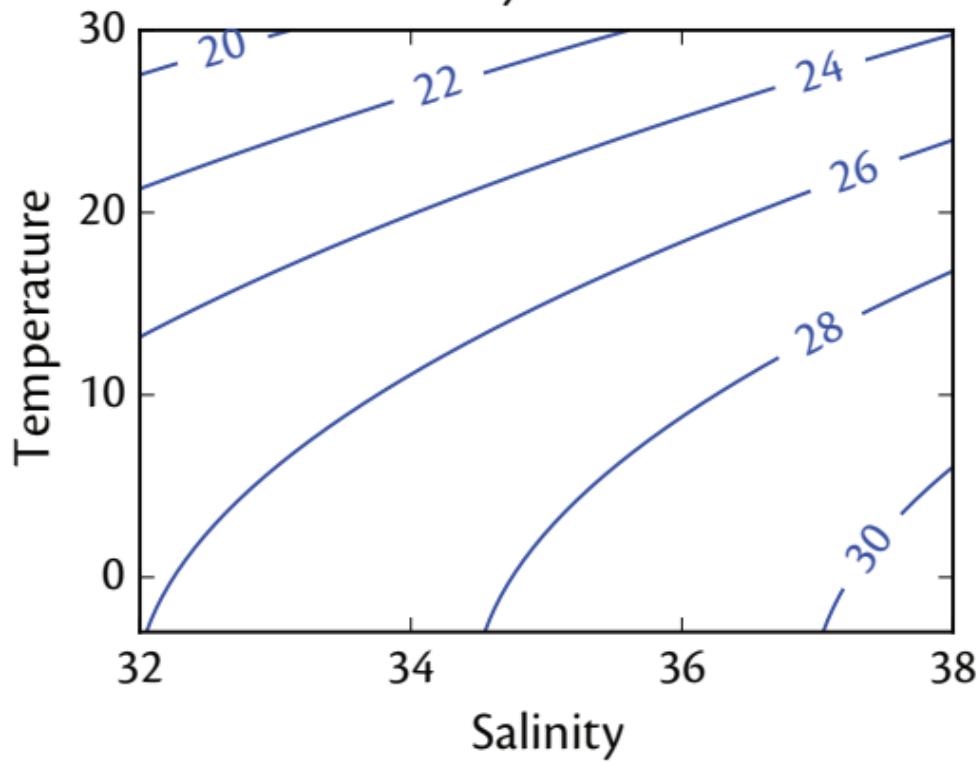


Fig. 1.2

Density at surface



Density at 4 km

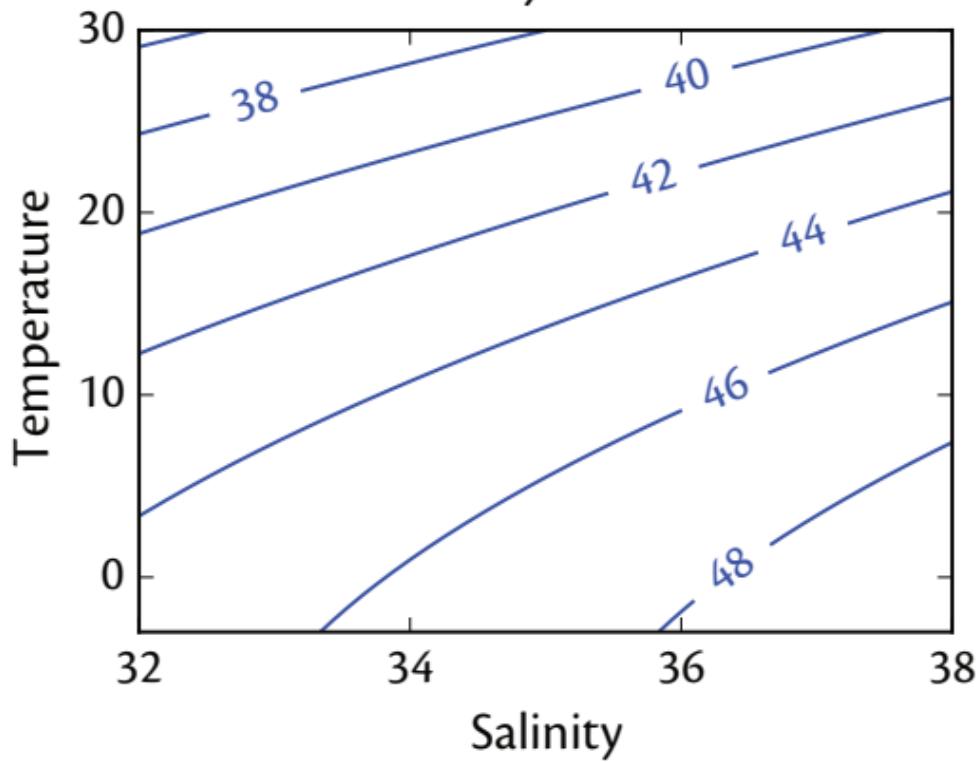


Fig. 1.3

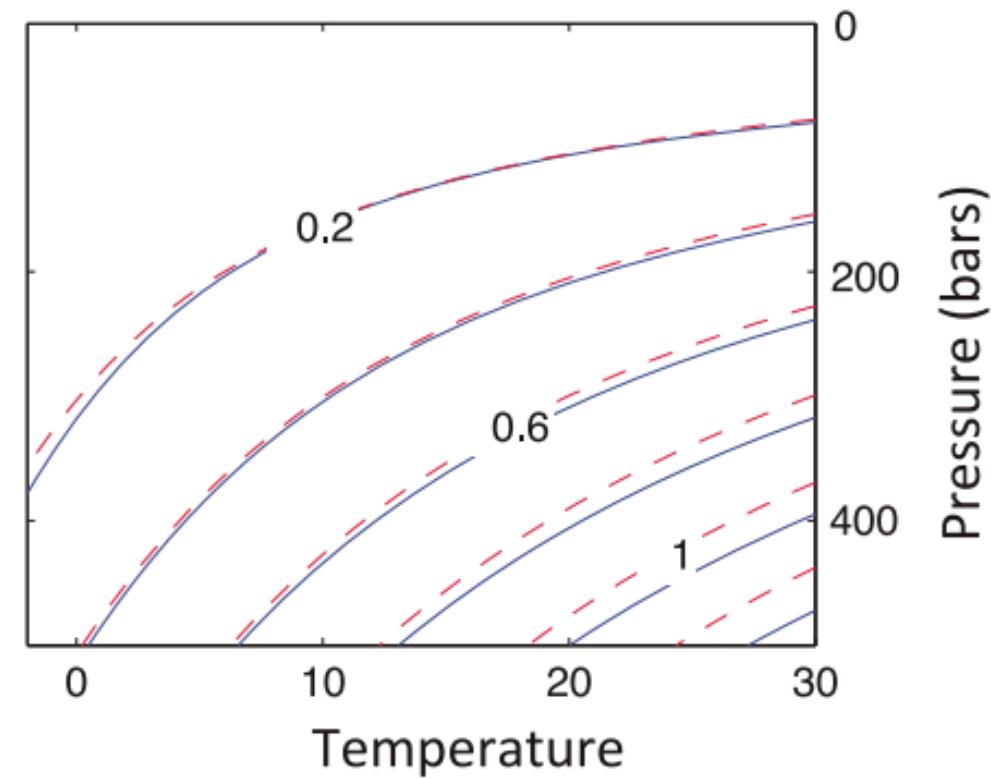
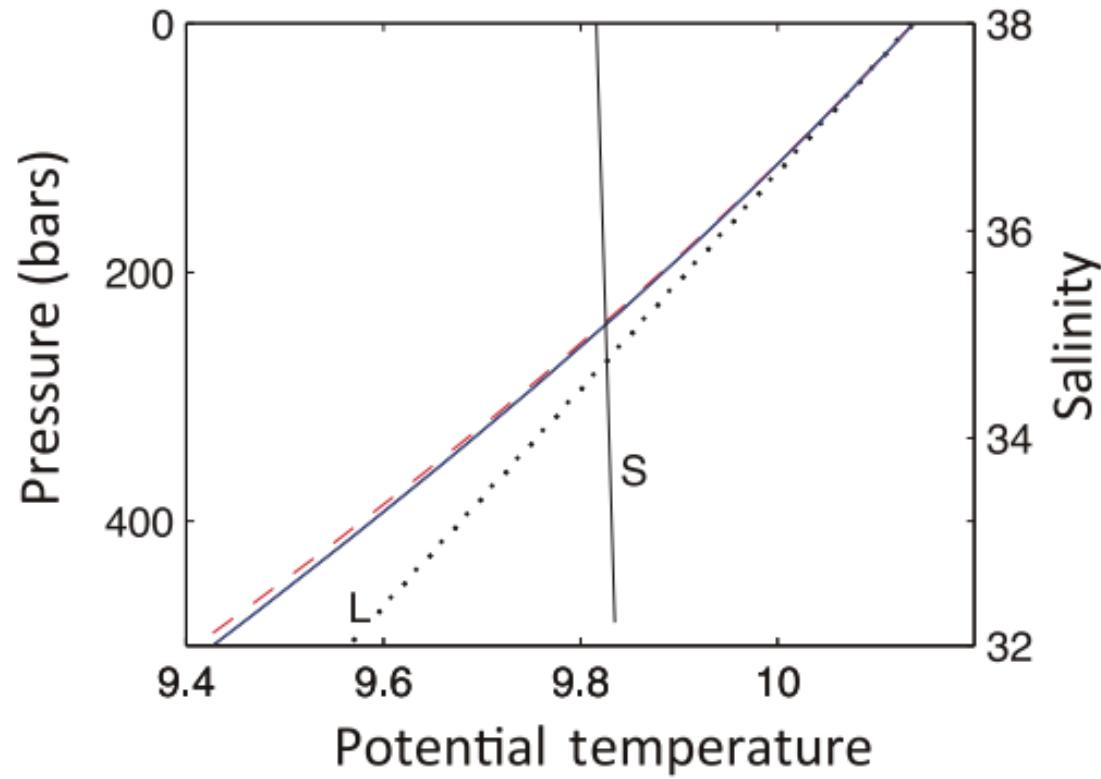


Fig. 1.4

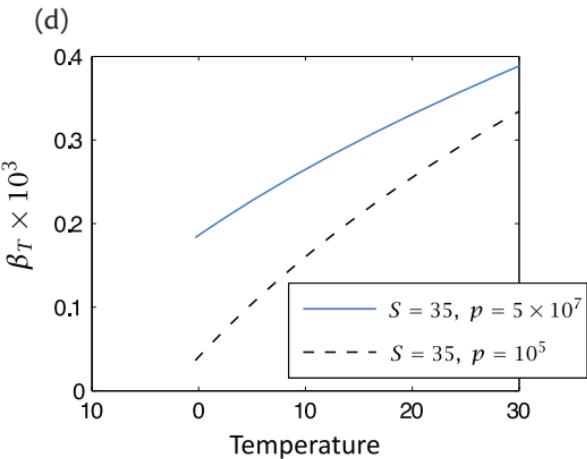
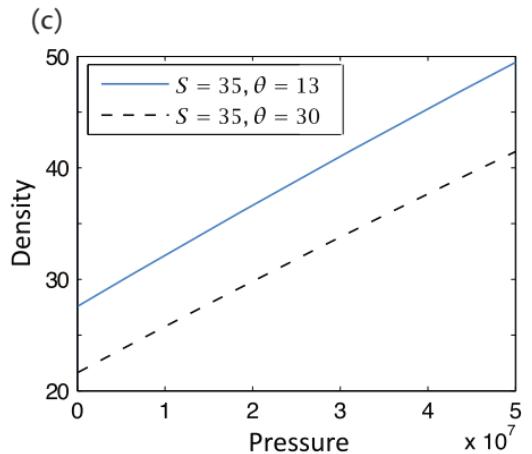
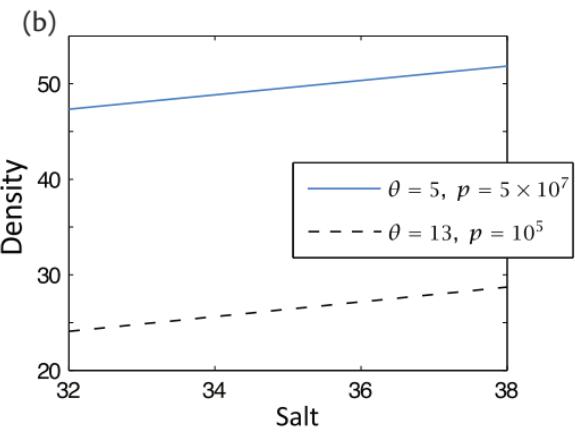
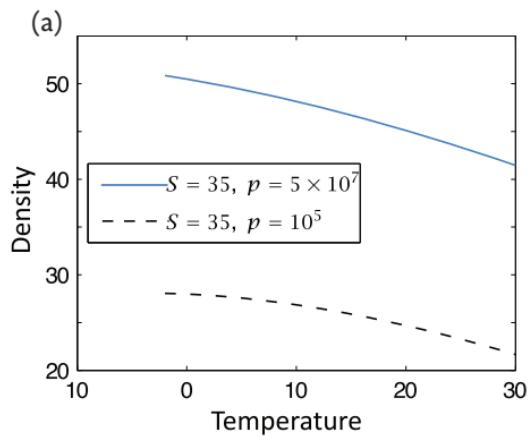


Fig. 1.5

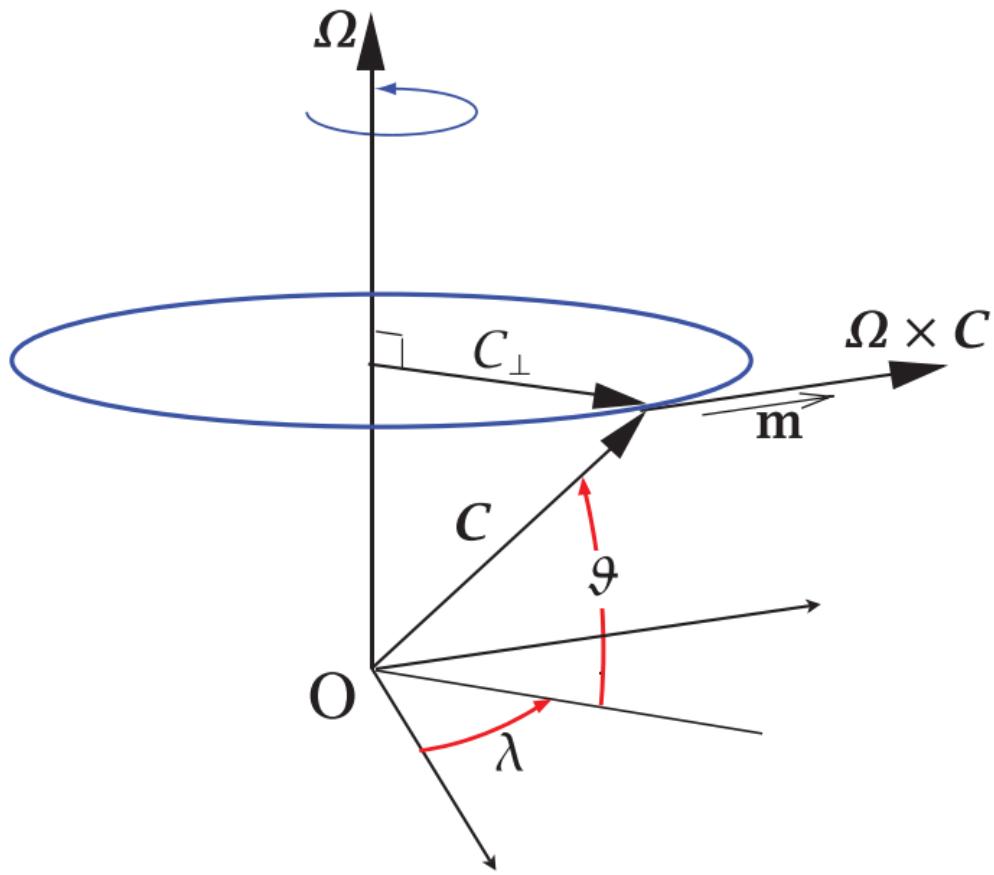


Fig. 2.1

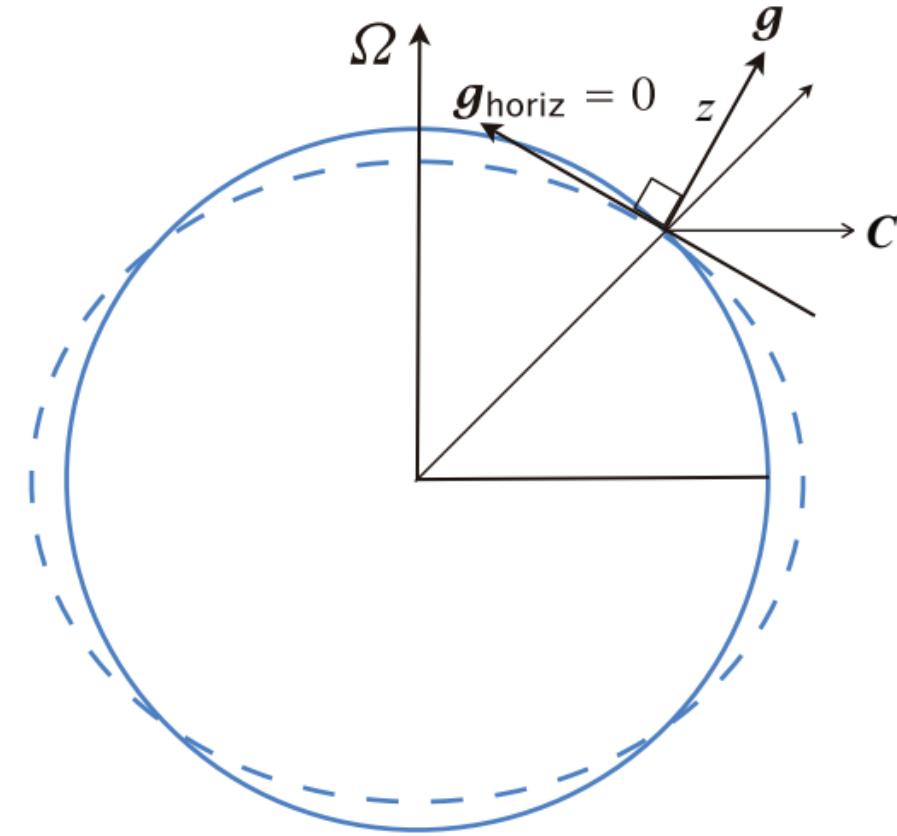
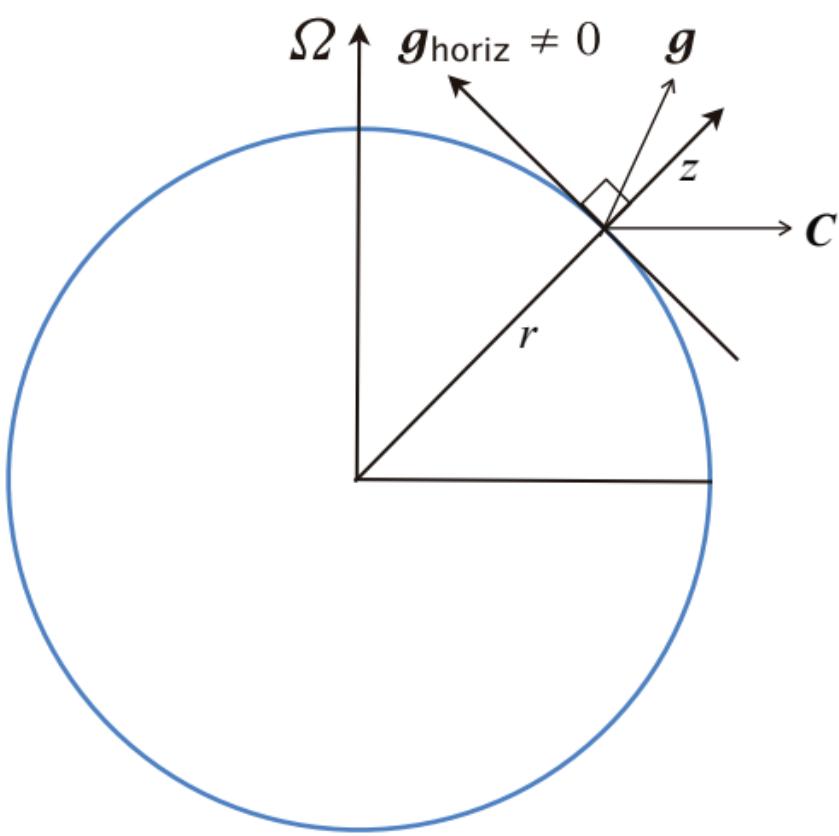


Fig. 2.2

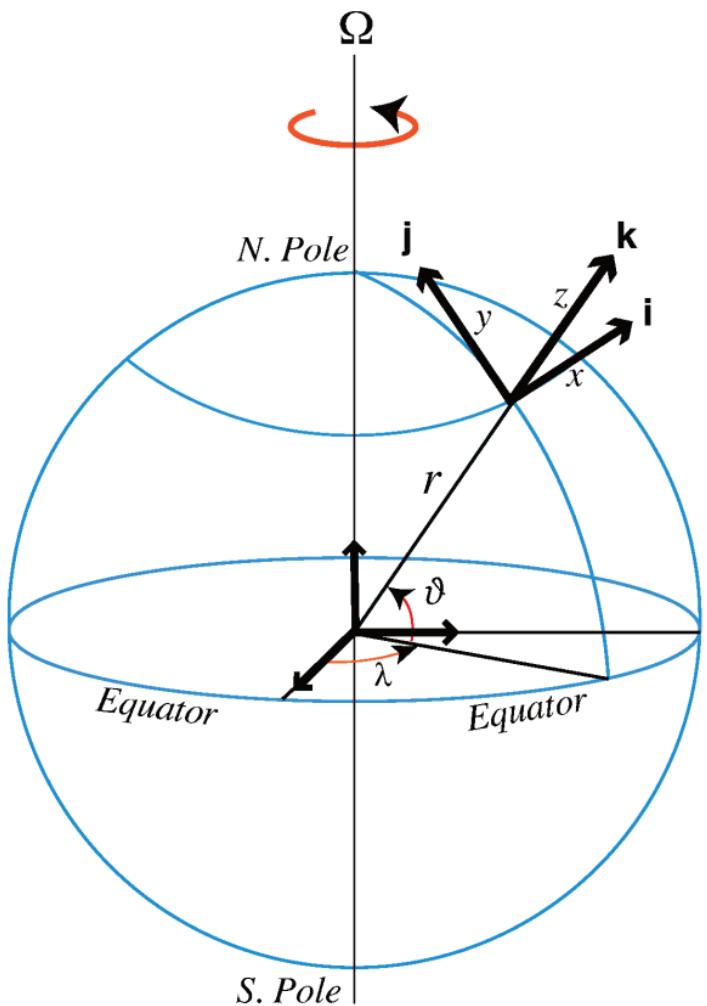


Fig. 2.3

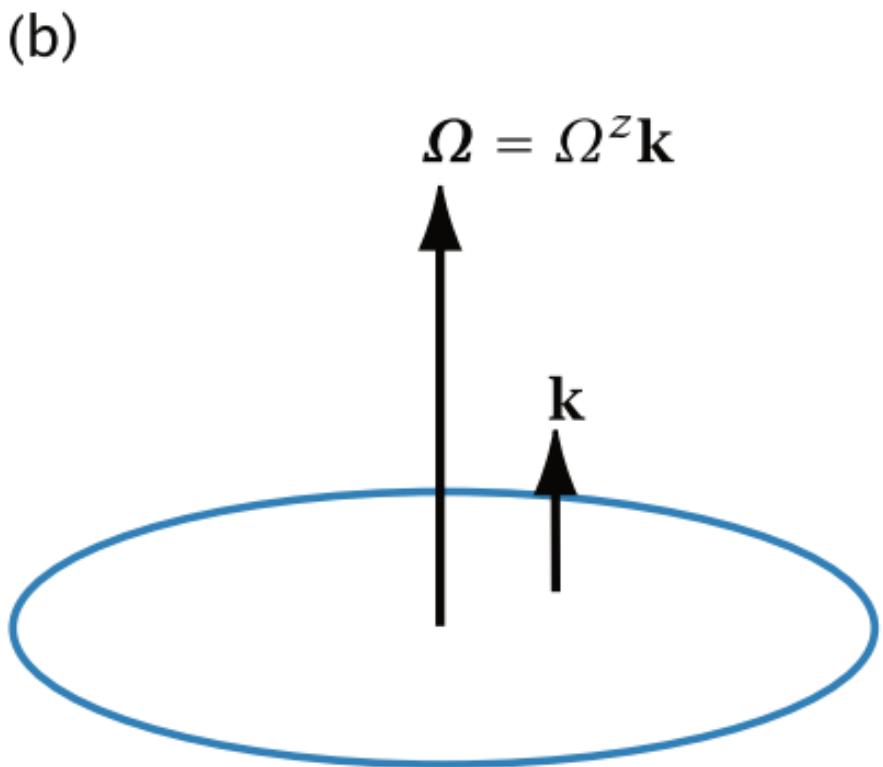
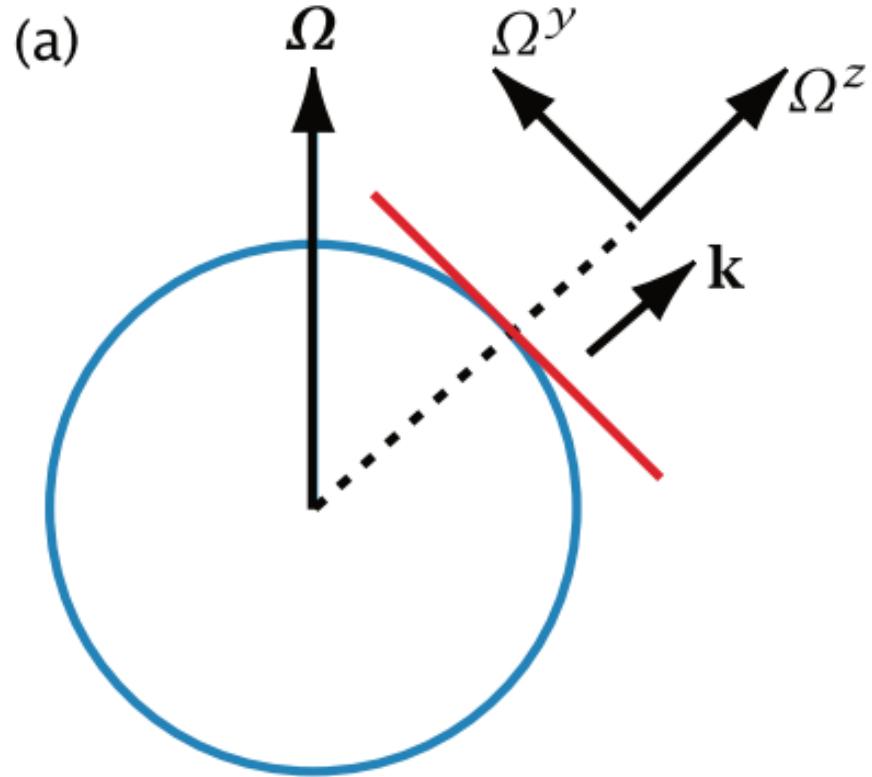


Fig. 2.4

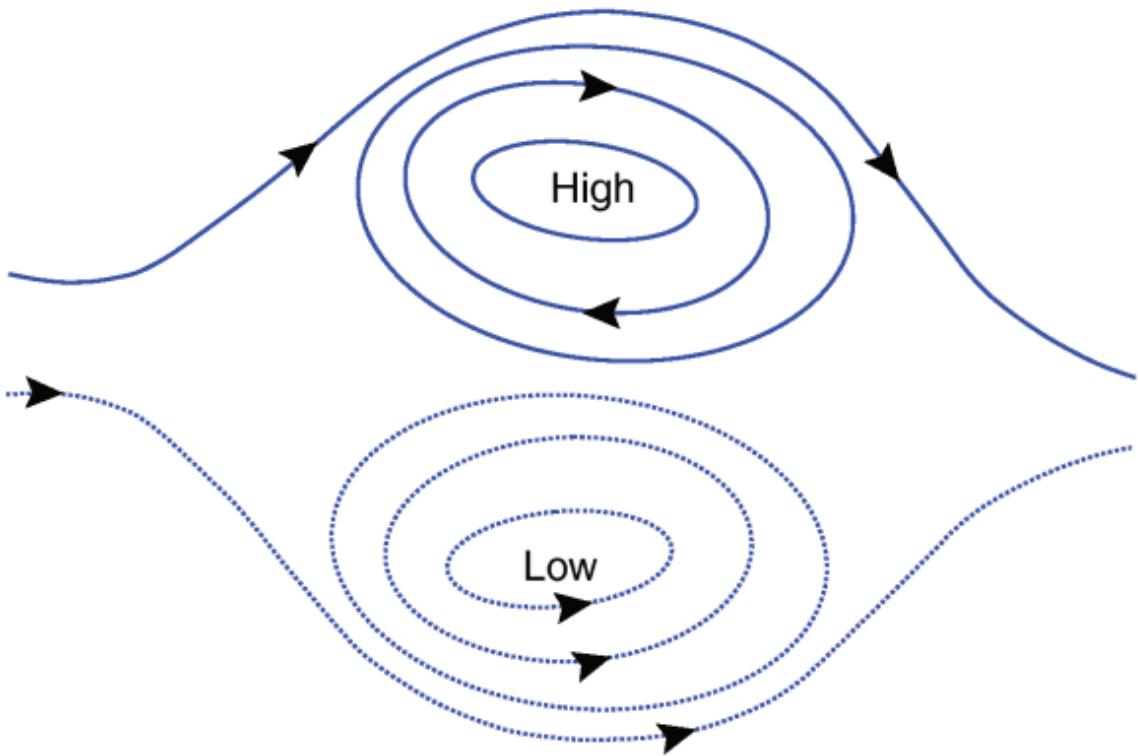


Fig. 2.5

Higher pressure $\xrightarrow{-\nabla p}$ Lower pressure

$$u \overset{\odot}{>} 0$$

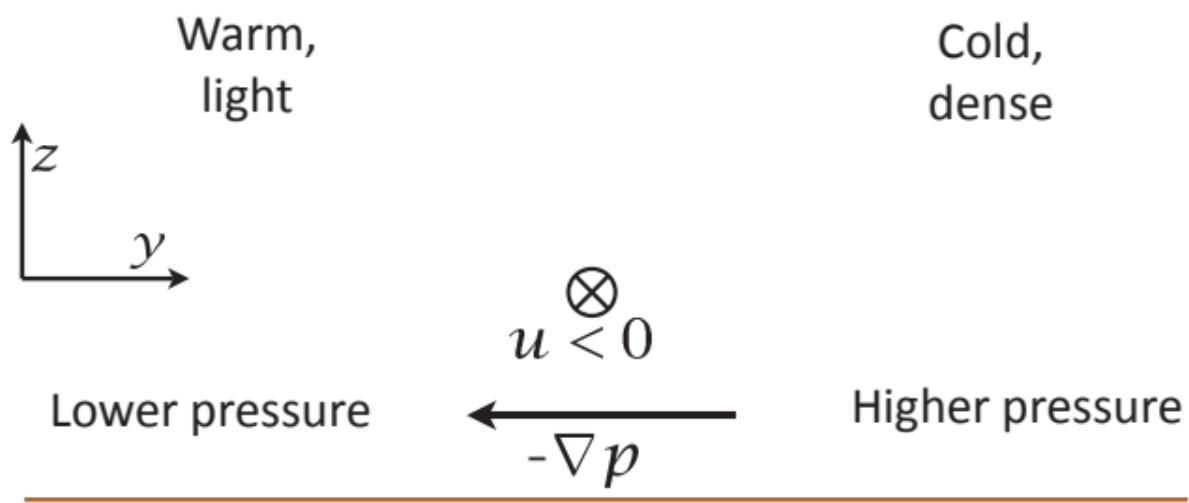


Fig. 2.6

$$\delta\theta = \frac{\delta r}{R} = \frac{|\delta s|}{|s|} = \delta|s|$$

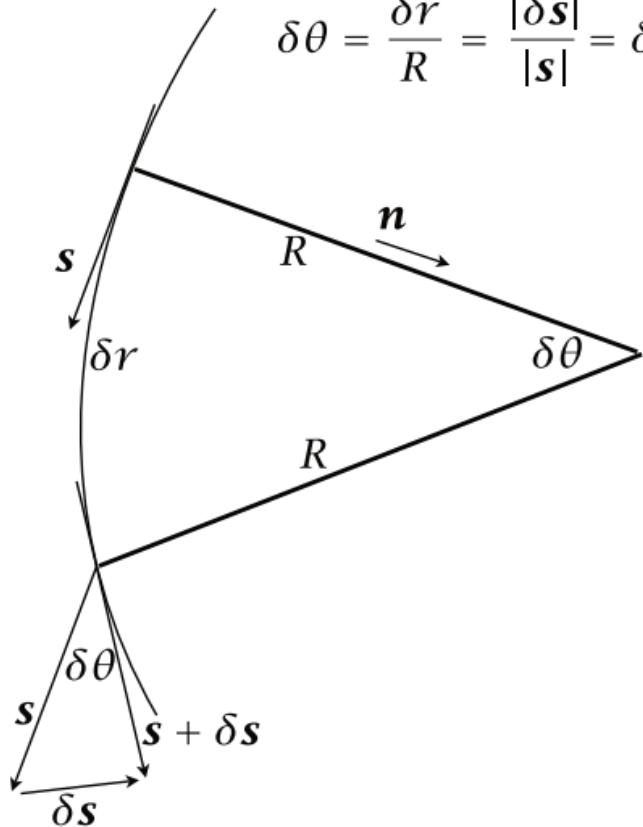
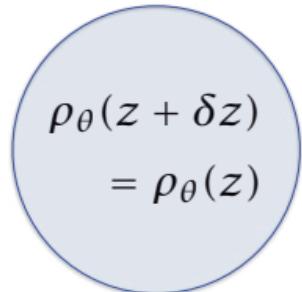


Fig. 2.7

$$\tilde{\rho}(z + \delta z) = \tilde{\rho}_\theta(z + \delta z)$$

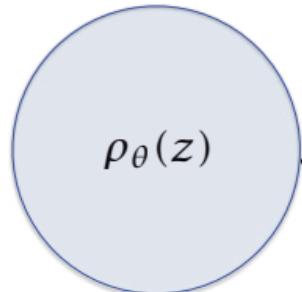
$$\rho(z + \delta z) = \tilde{\rho}_\theta(z)$$



$z + \delta z$



$$\rho_\theta(z) = \tilde{\rho}_\theta(z)$$



z

Fig. 2.8

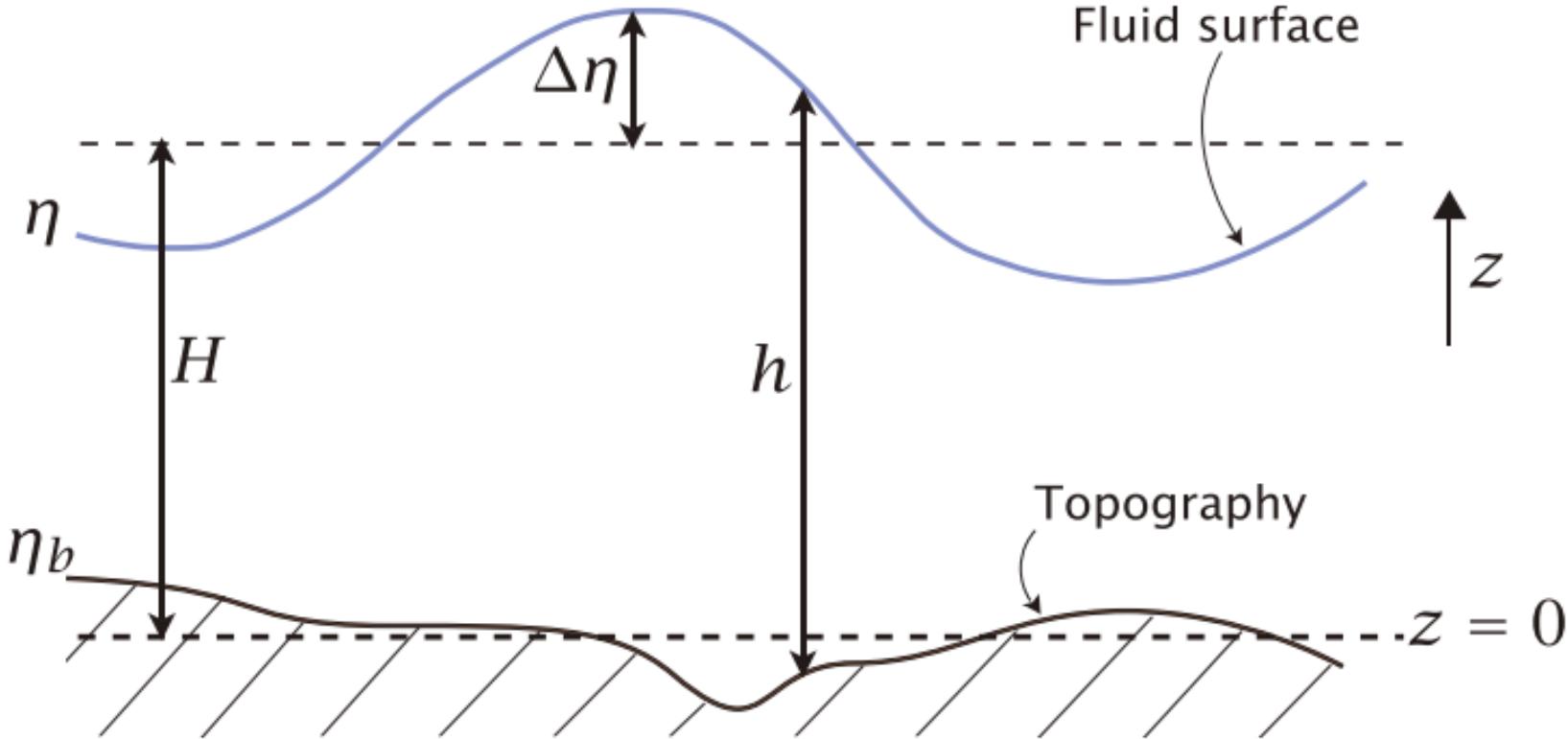


Fig. 3.1

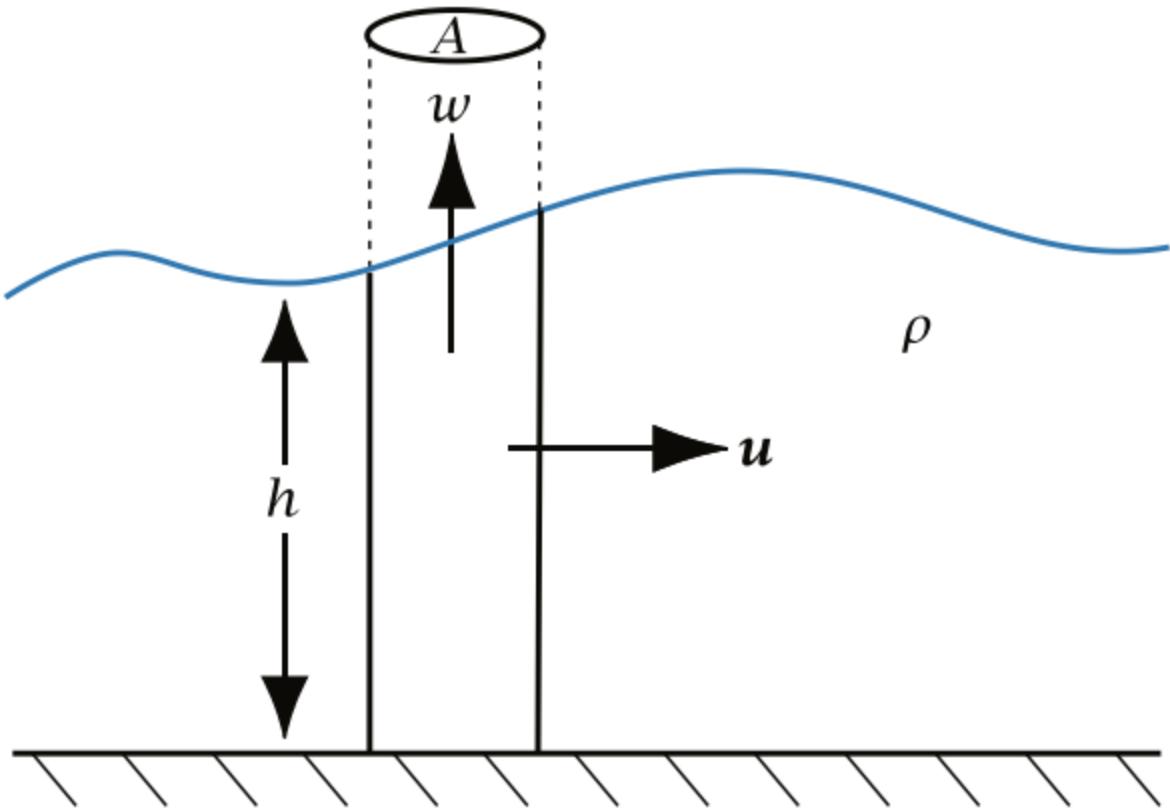


Fig. 3.2

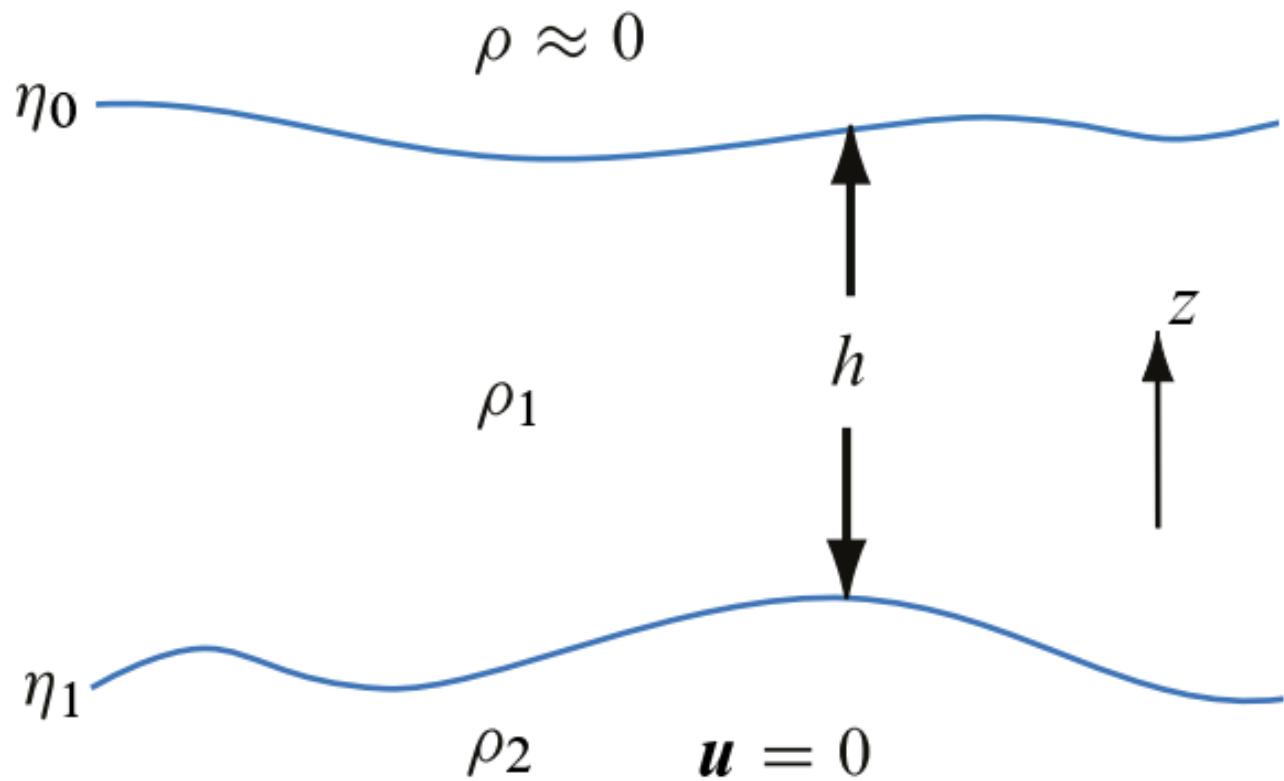


Fig. 3.3

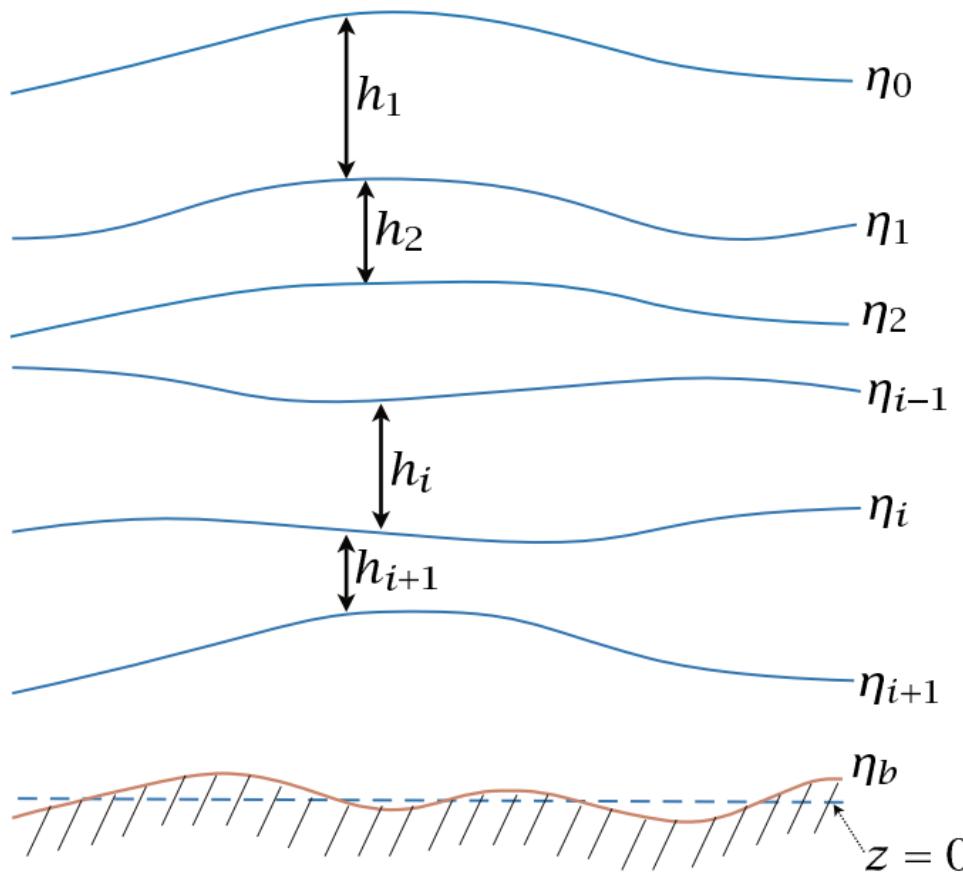


Fig. 3.4

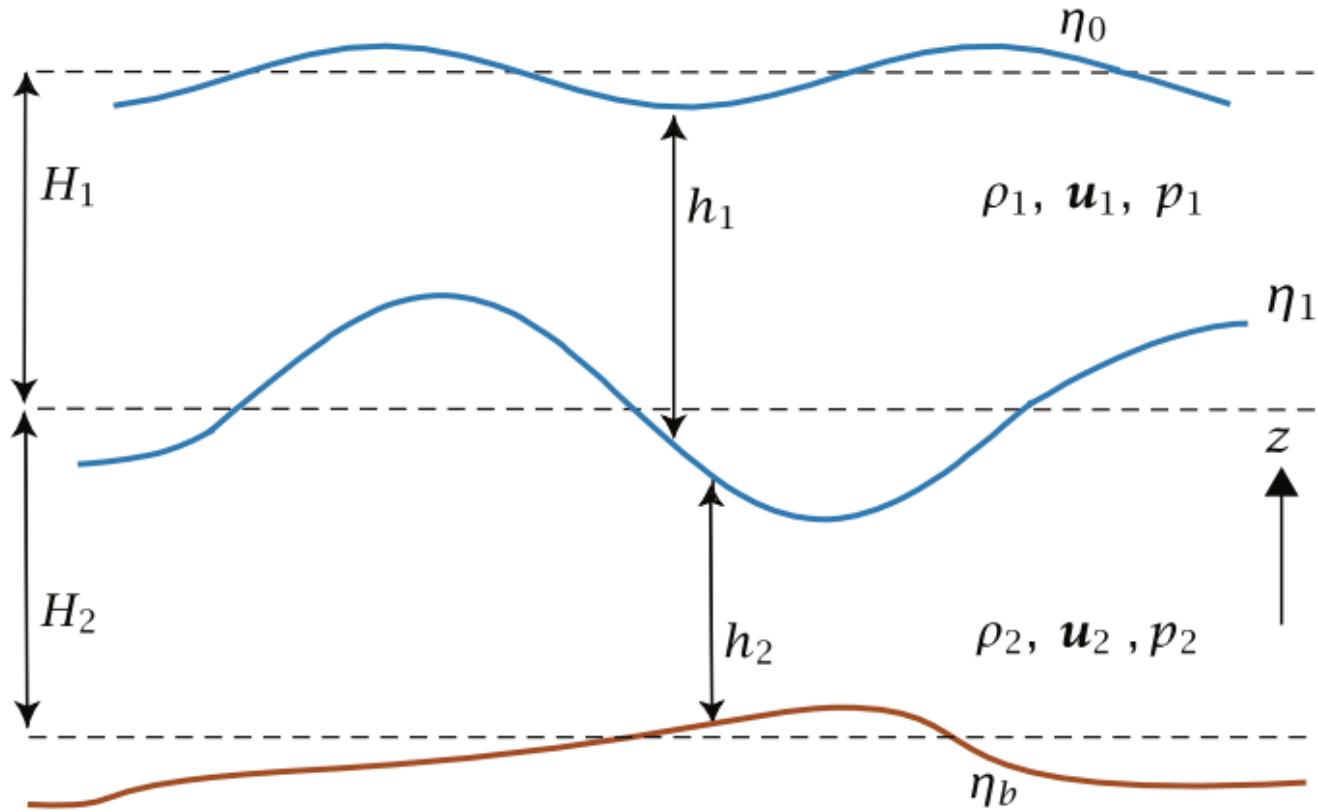


Fig. 3.5

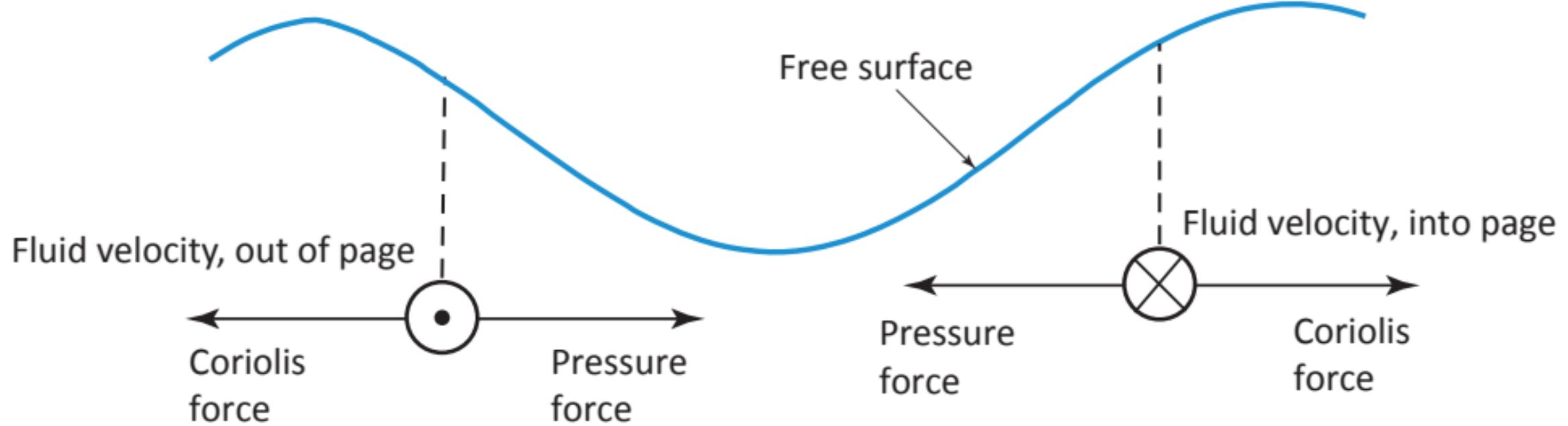


Fig. 3.6

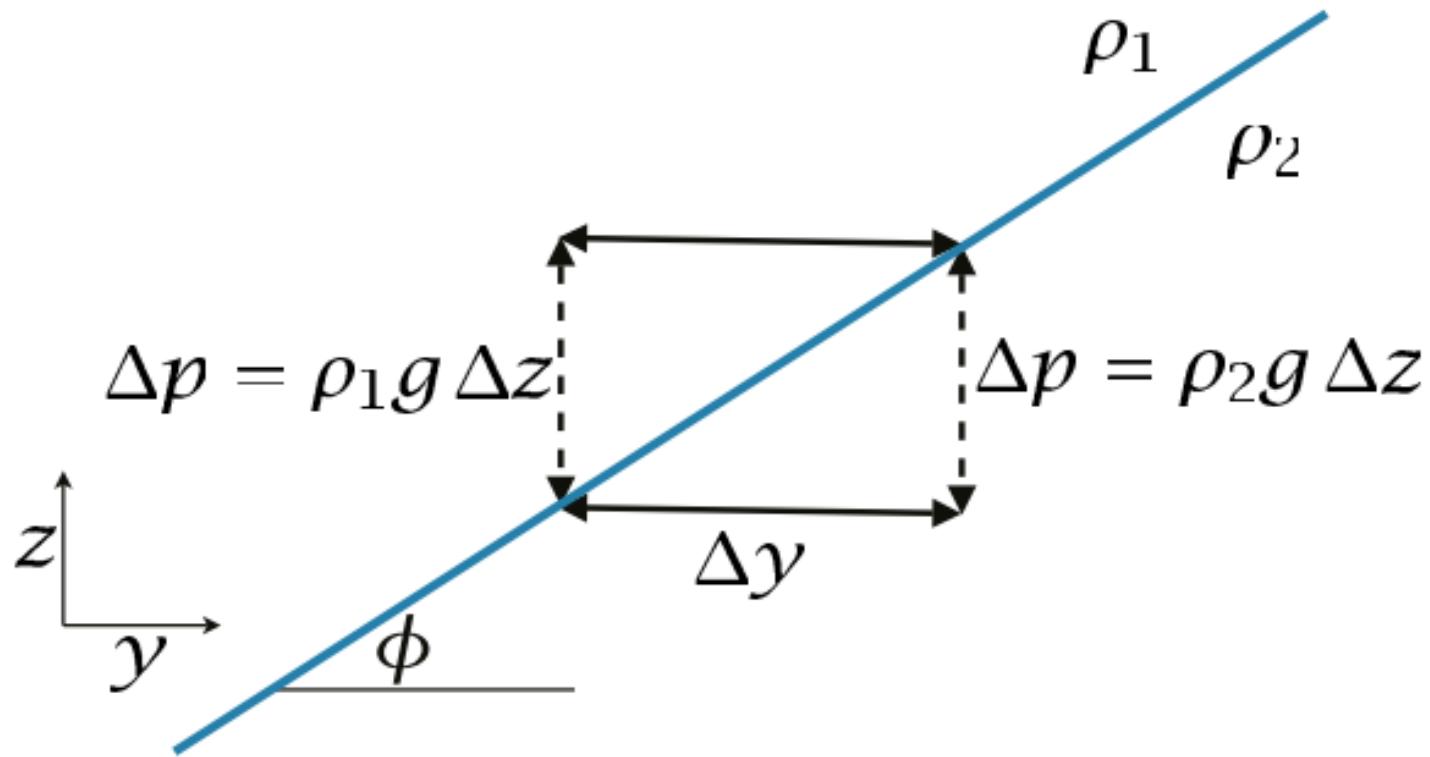


Fig. 3.7

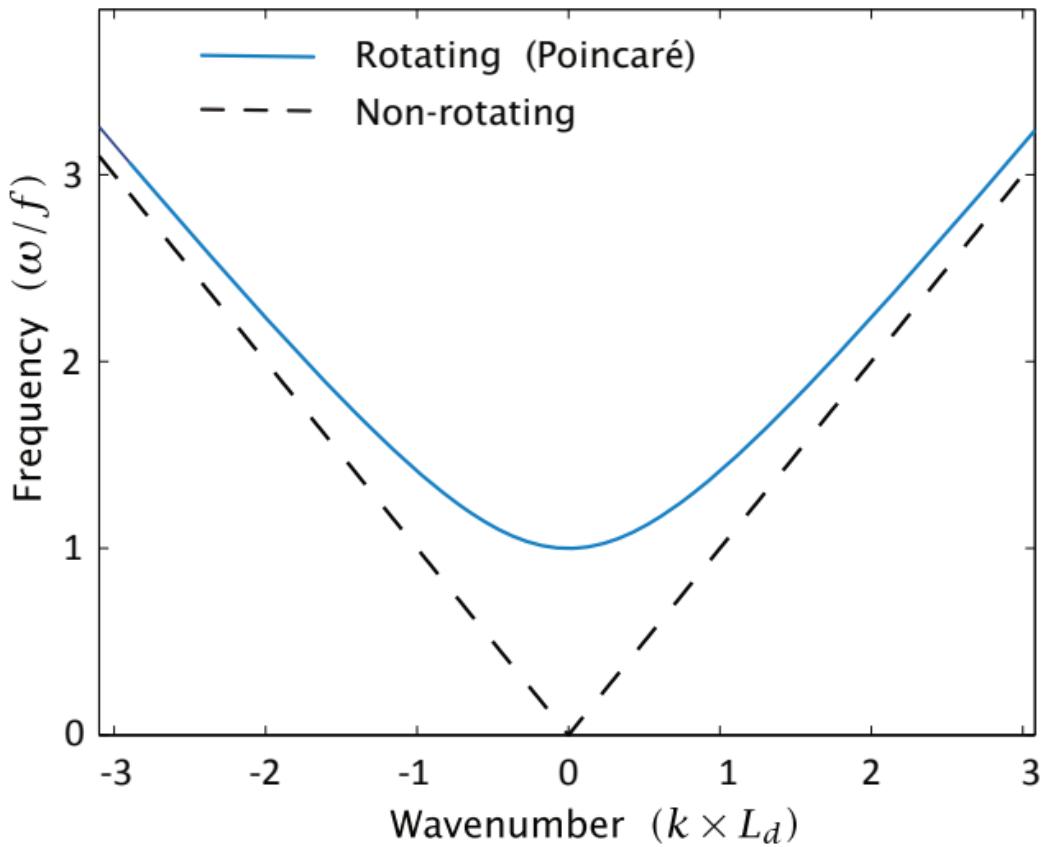


Fig. 3.8

Perturbation height

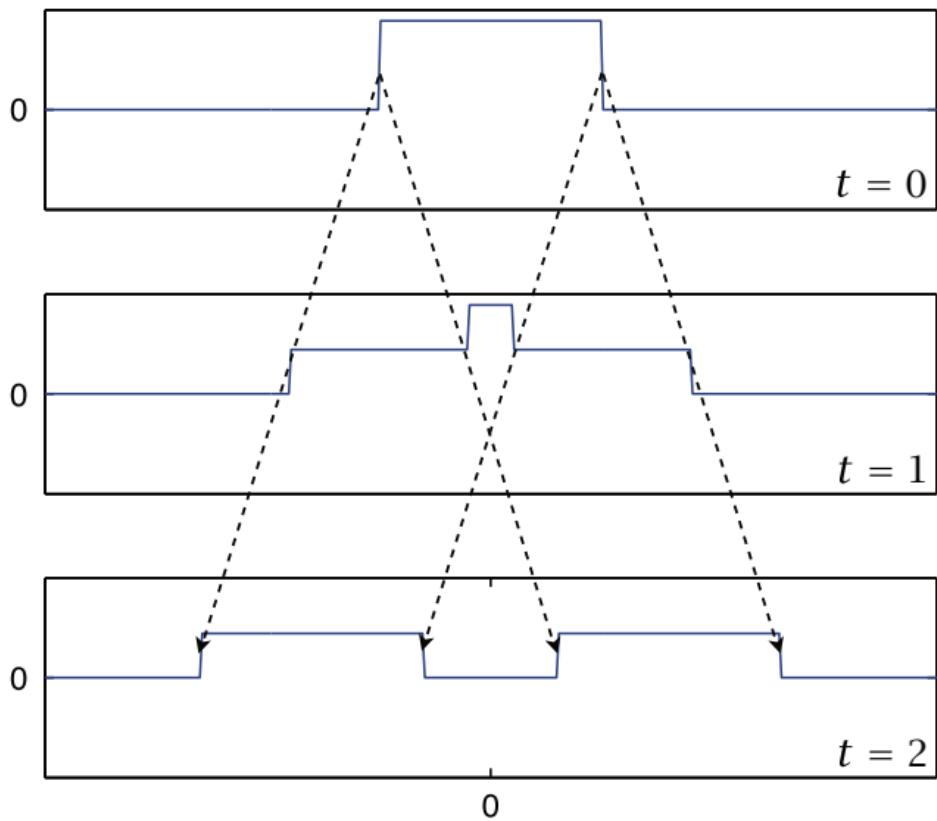


Fig. 3.9

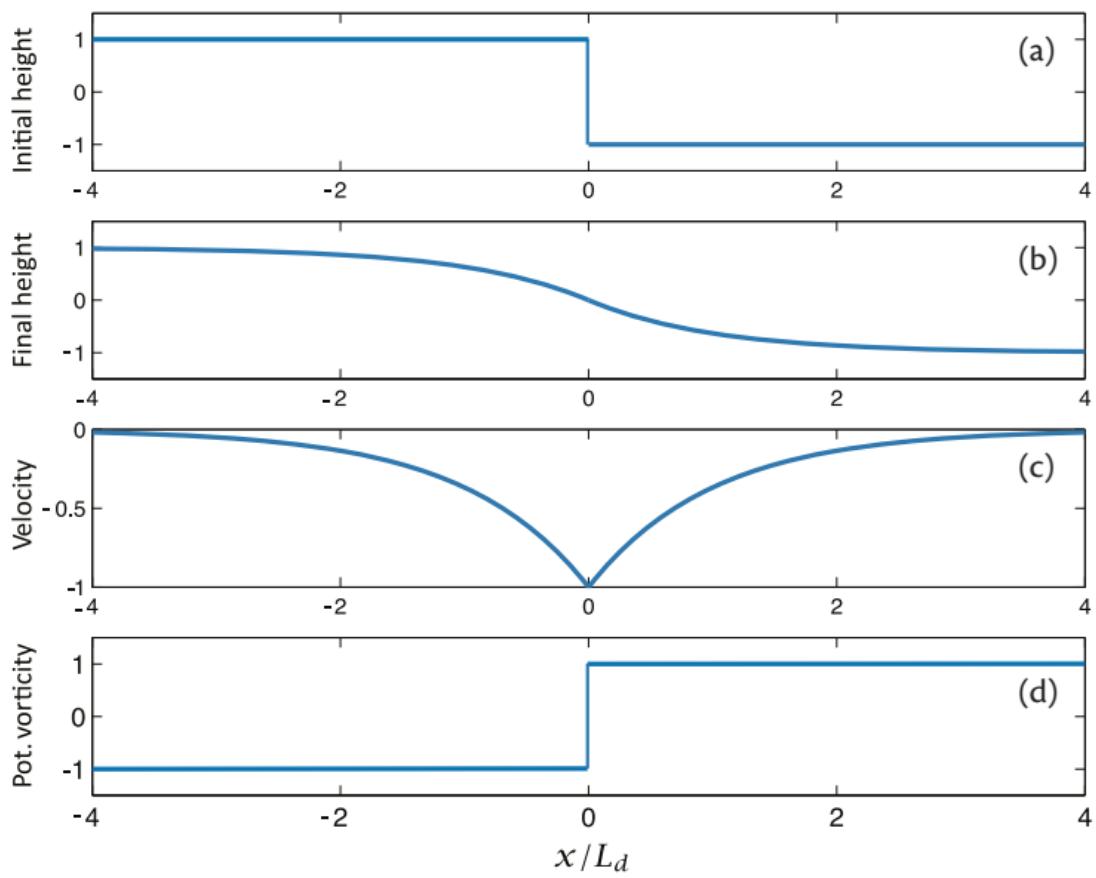


Fig. 3.10

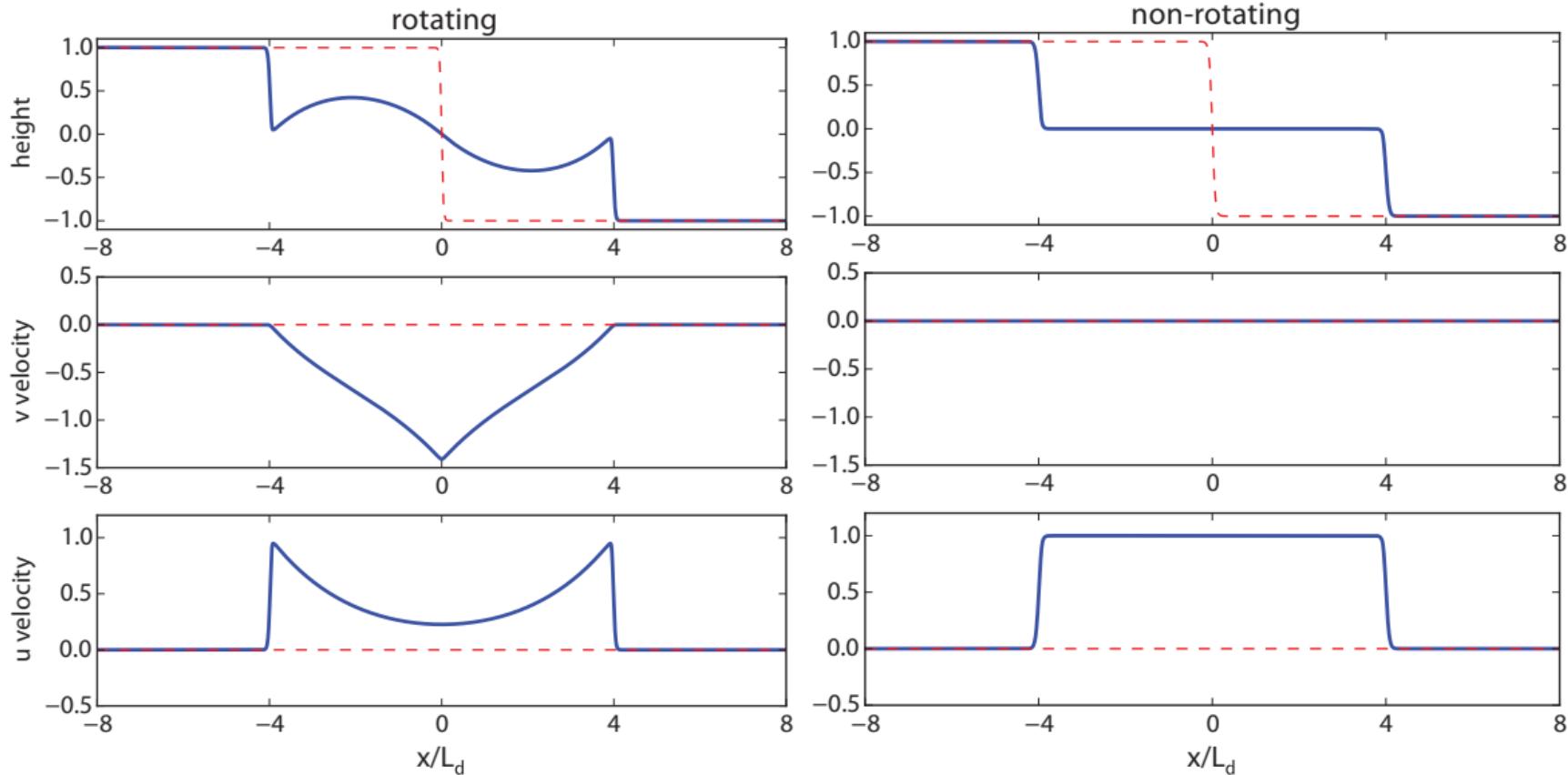


Fig. 3.11

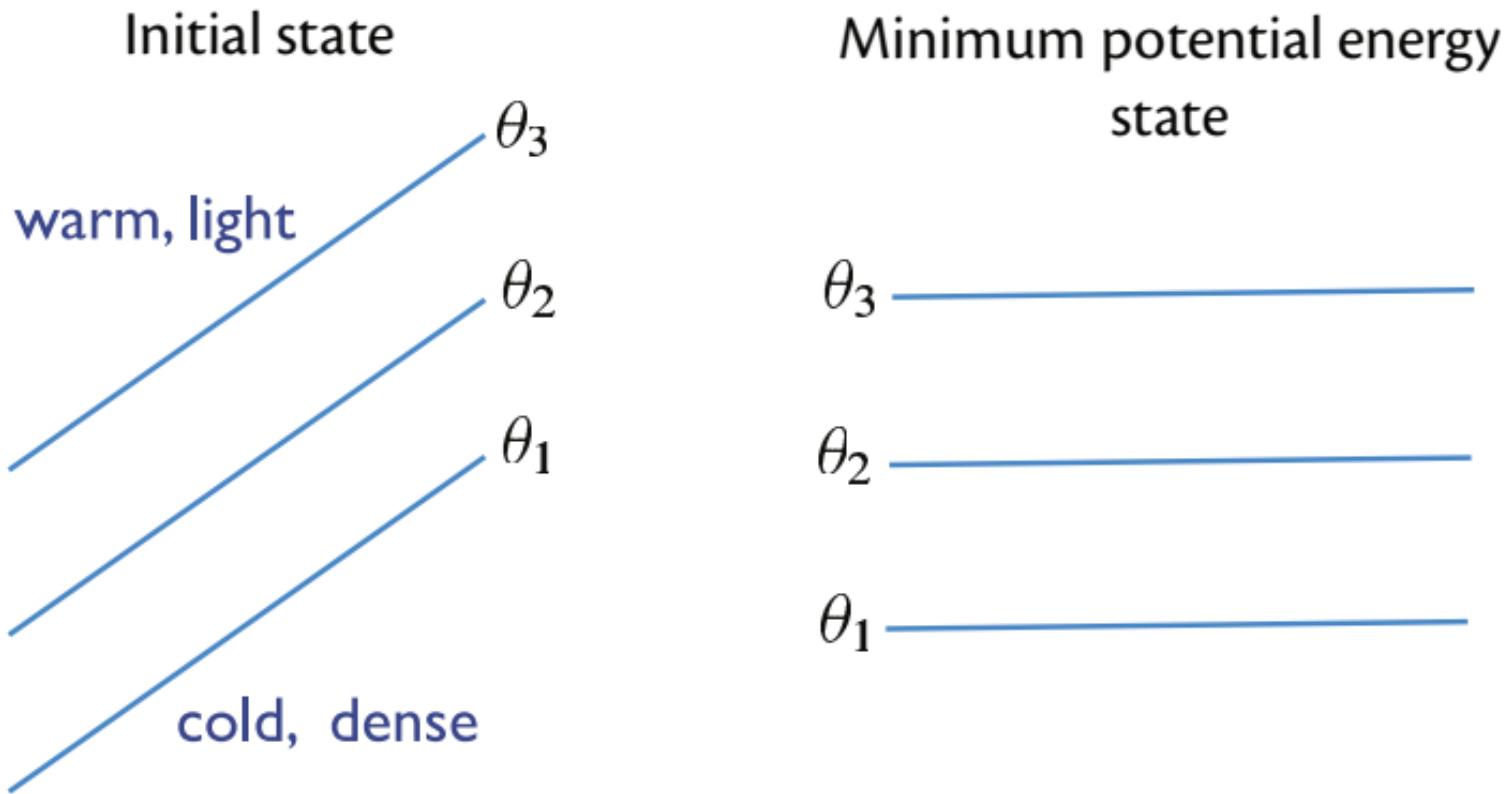


Fig. 3.12

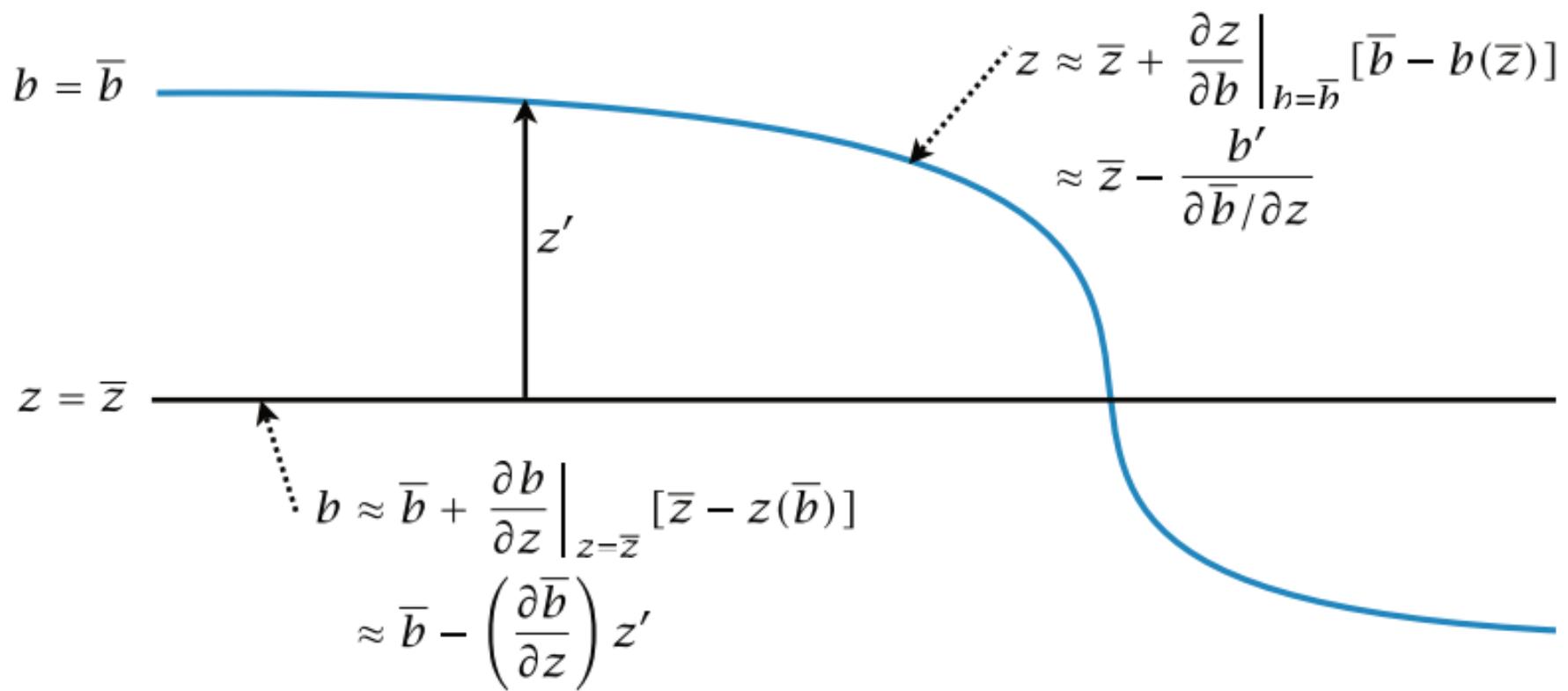


Fig. 3.13

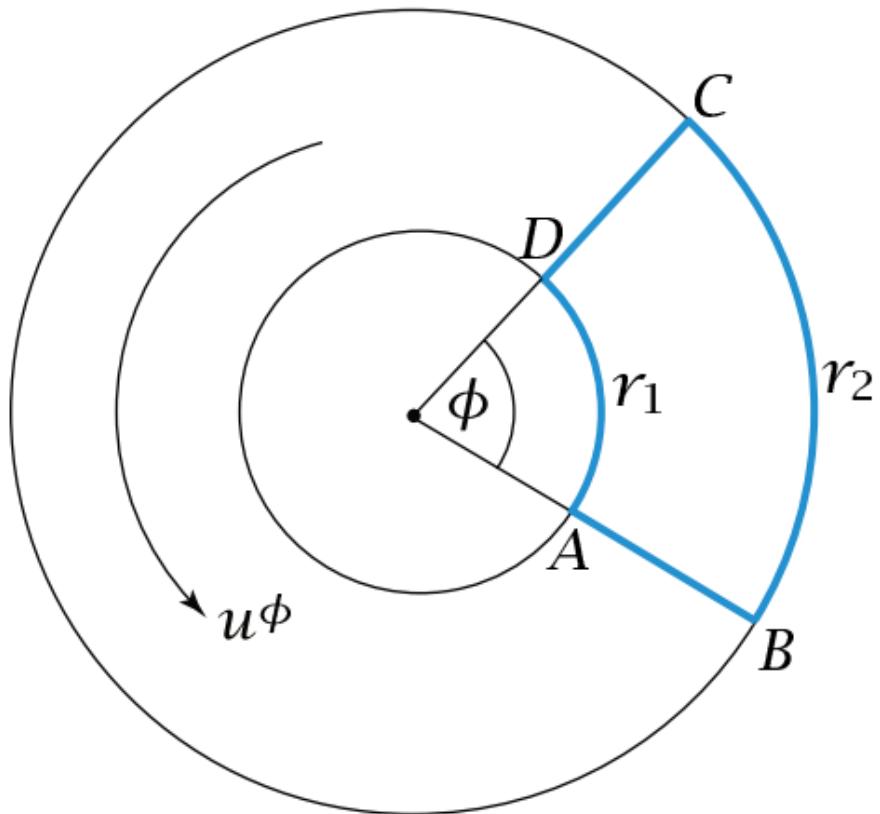


Fig. 4.1

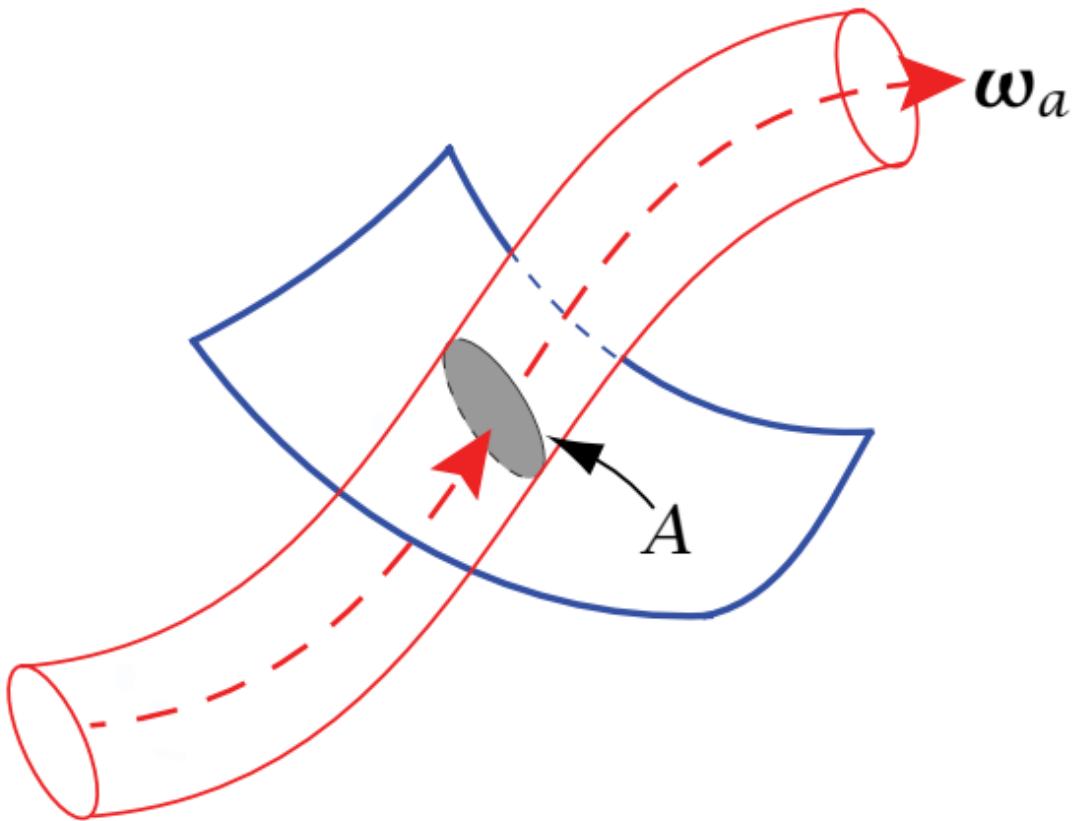


Fig. 4.2

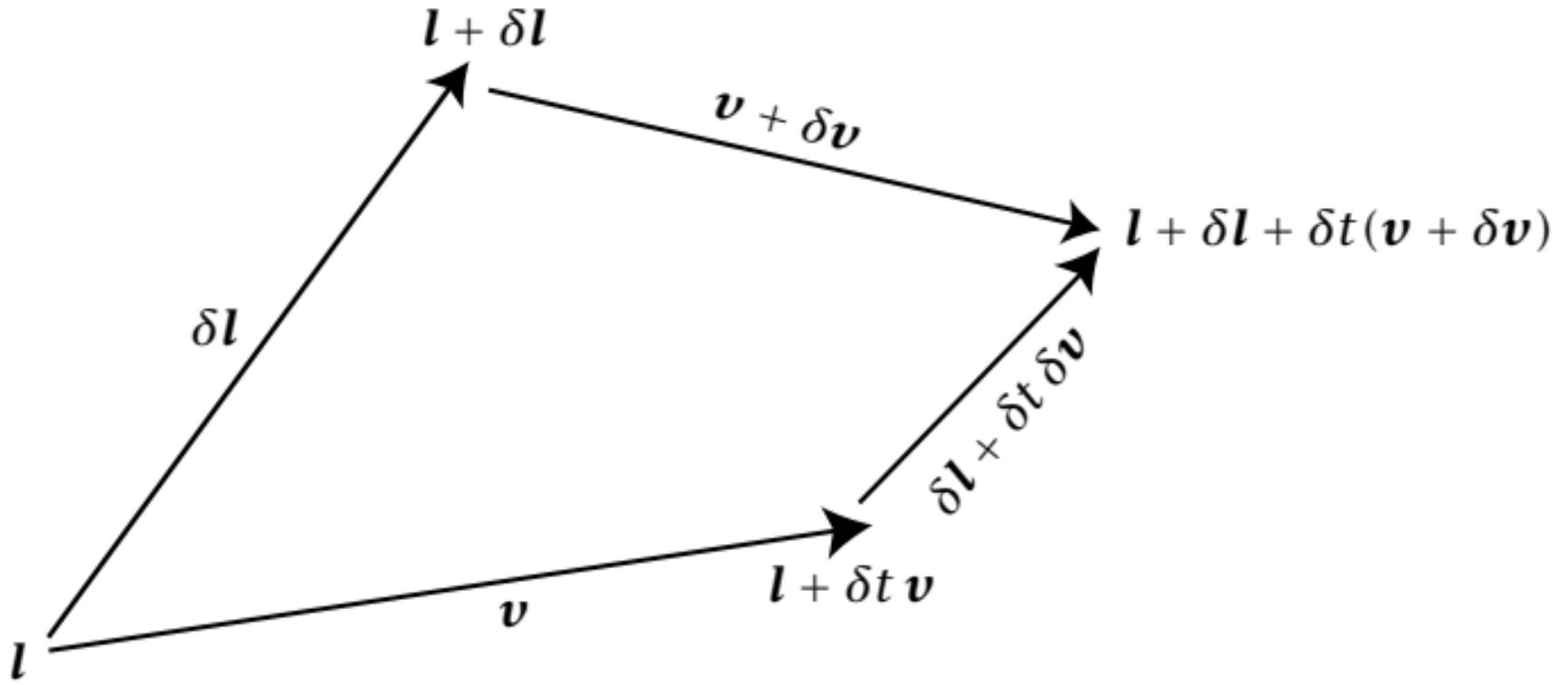


Fig. 4.3

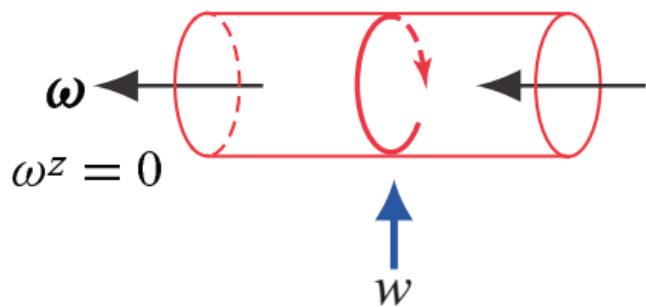
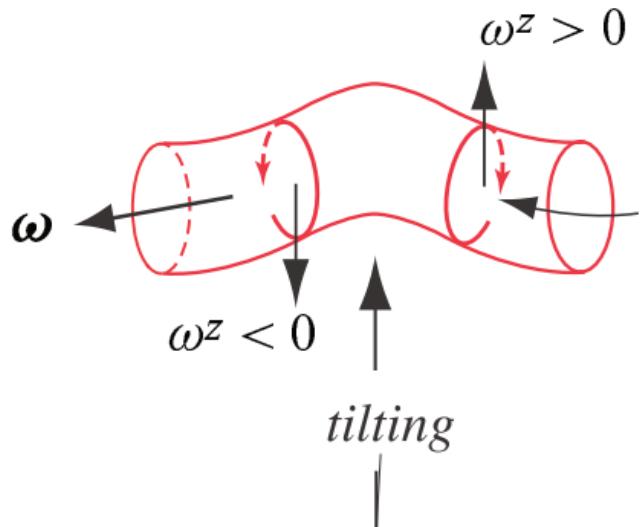


Fig. 4.4

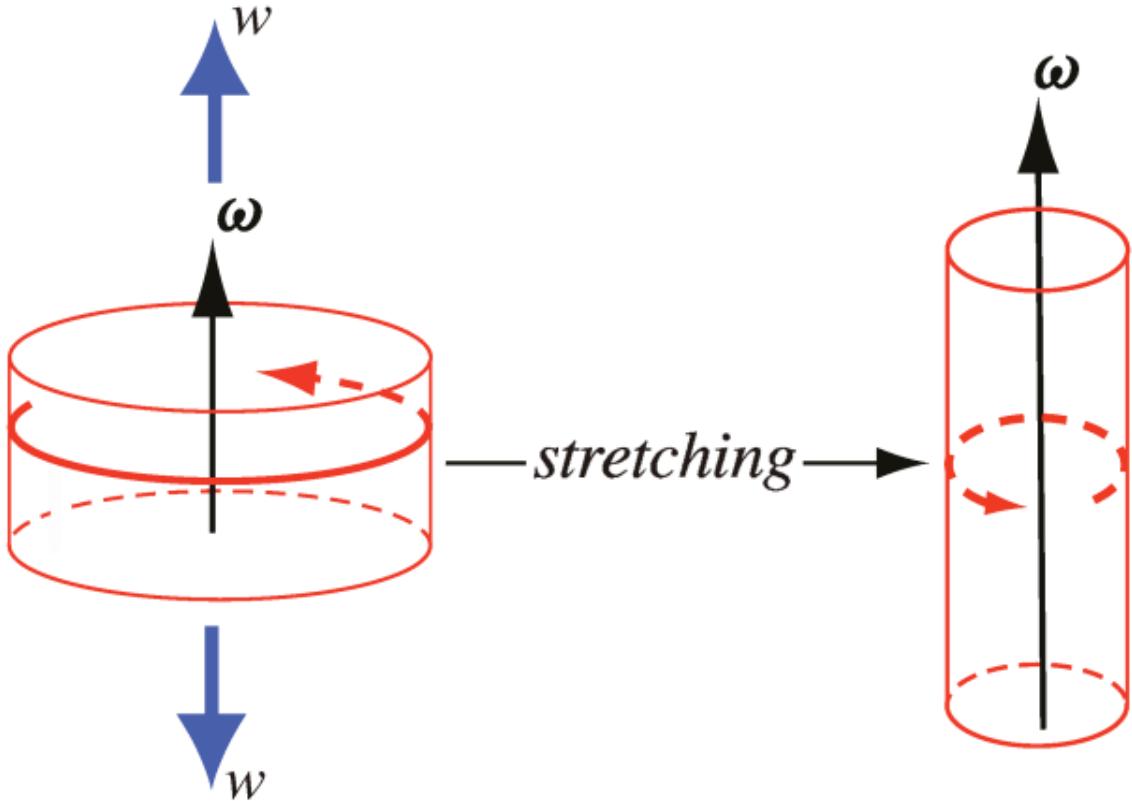


Fig. 4.5

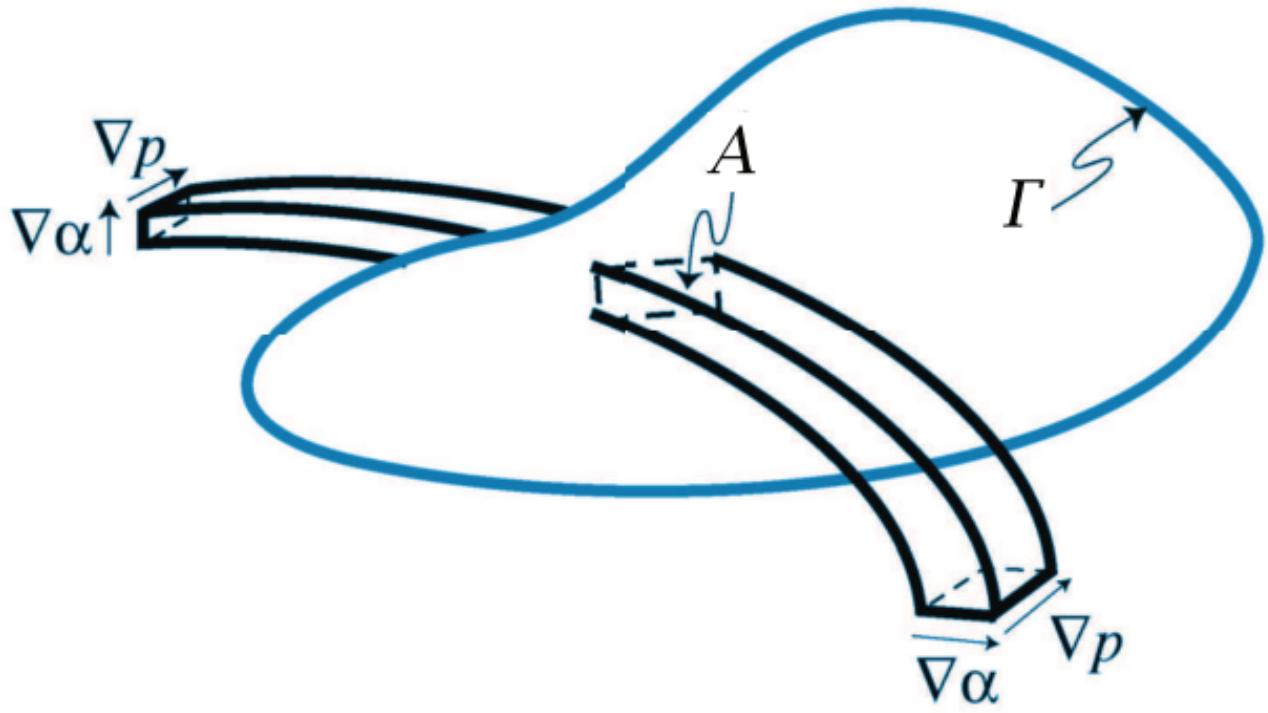


Fig. 4.6

$$\int_A (\omega + 2\Omega) \cdot dA = 2\Omega A_{\perp}$$

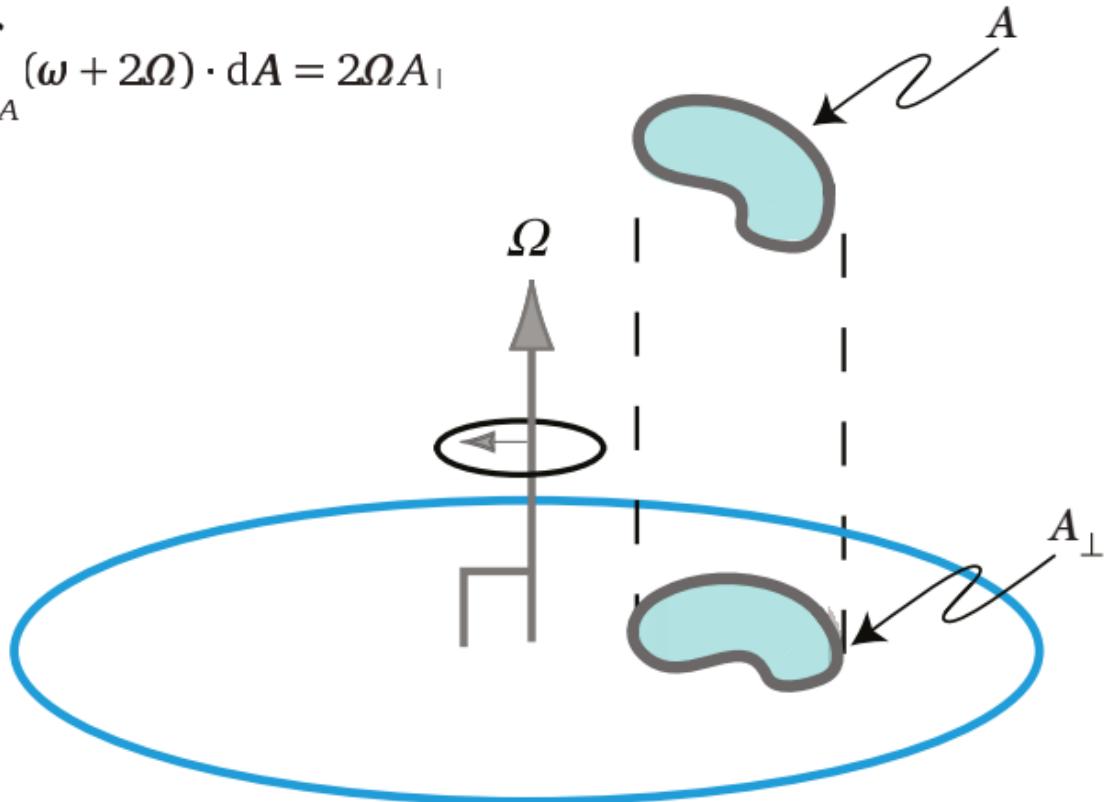


Fig. 4.7

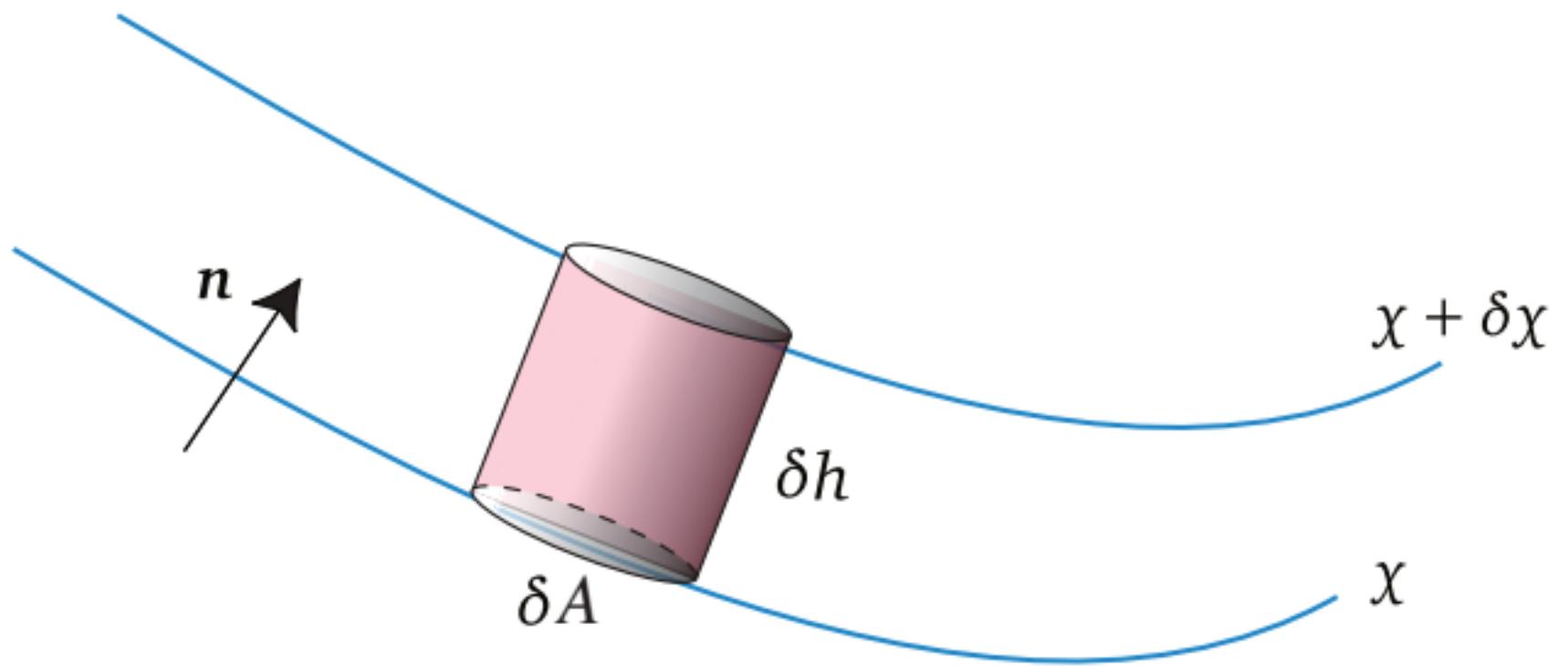
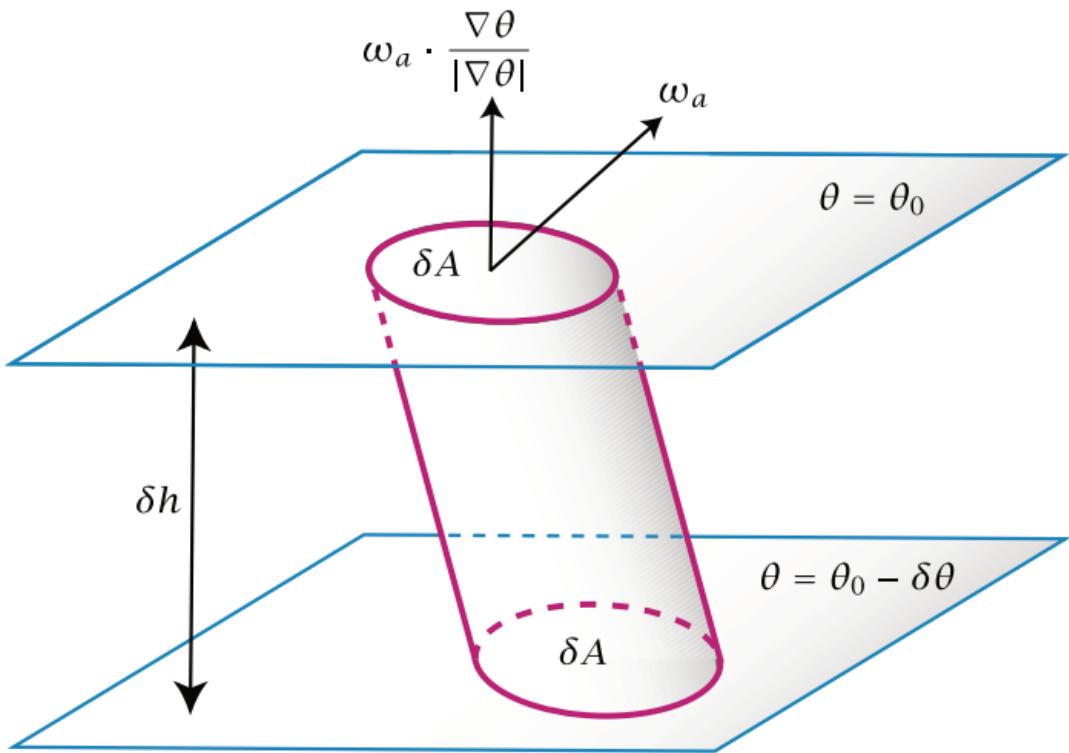


Fig. 4.8



$\text{mass} = \rho \delta A \delta h = \text{constant}$
 $\text{entropy} \propto \delta \theta = \delta h |\nabla \theta| = \text{constant}$

Fig. 4.9

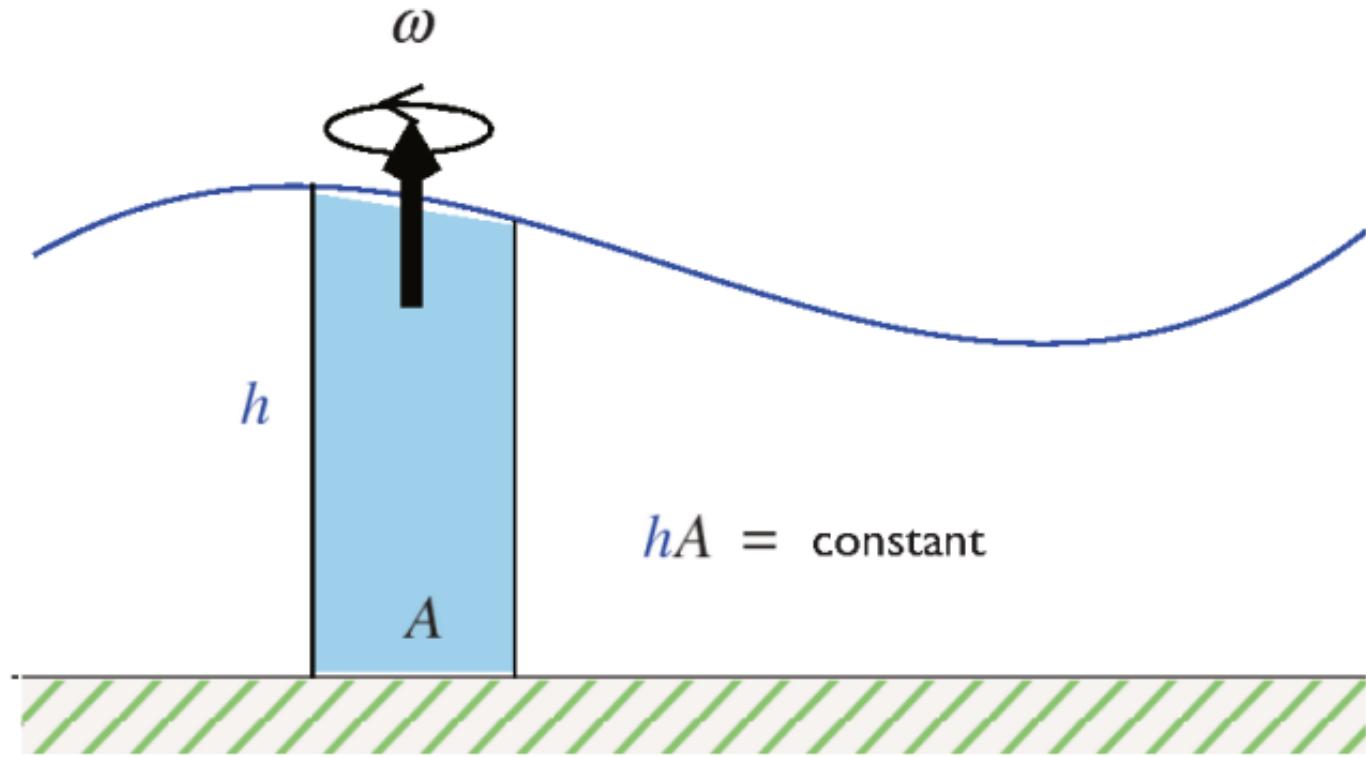
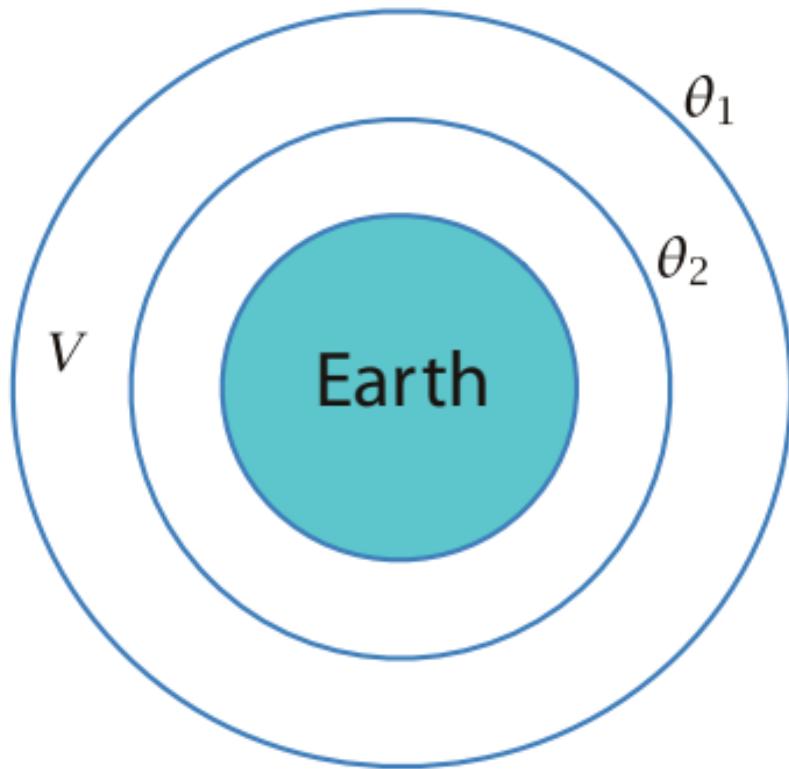


Fig. 4.10

(a)



(b)

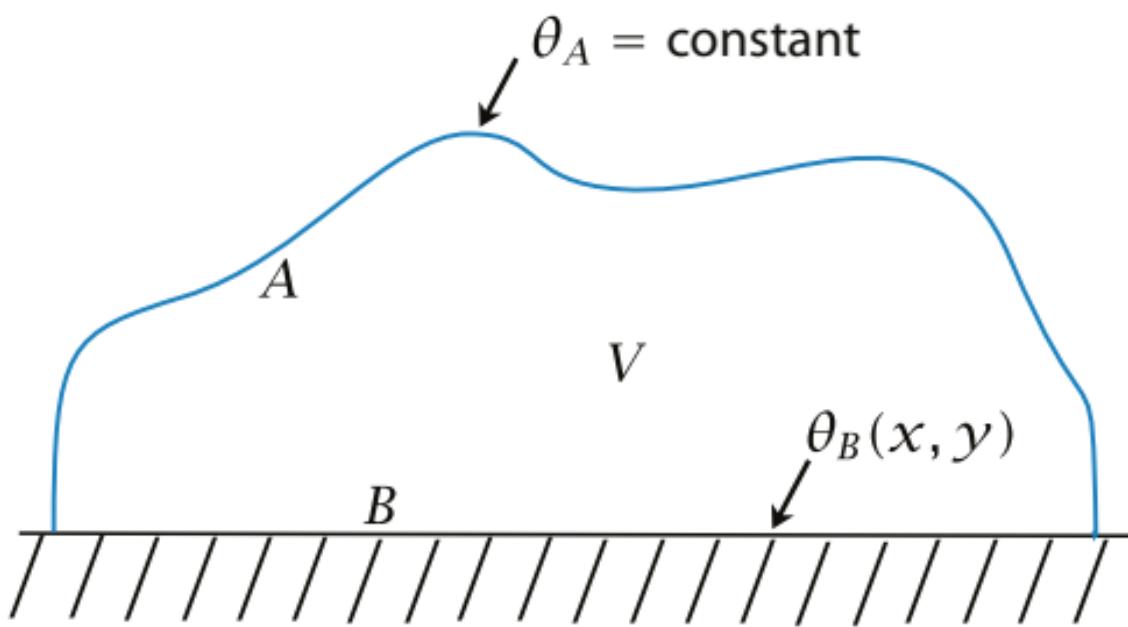


Fig. 4.11

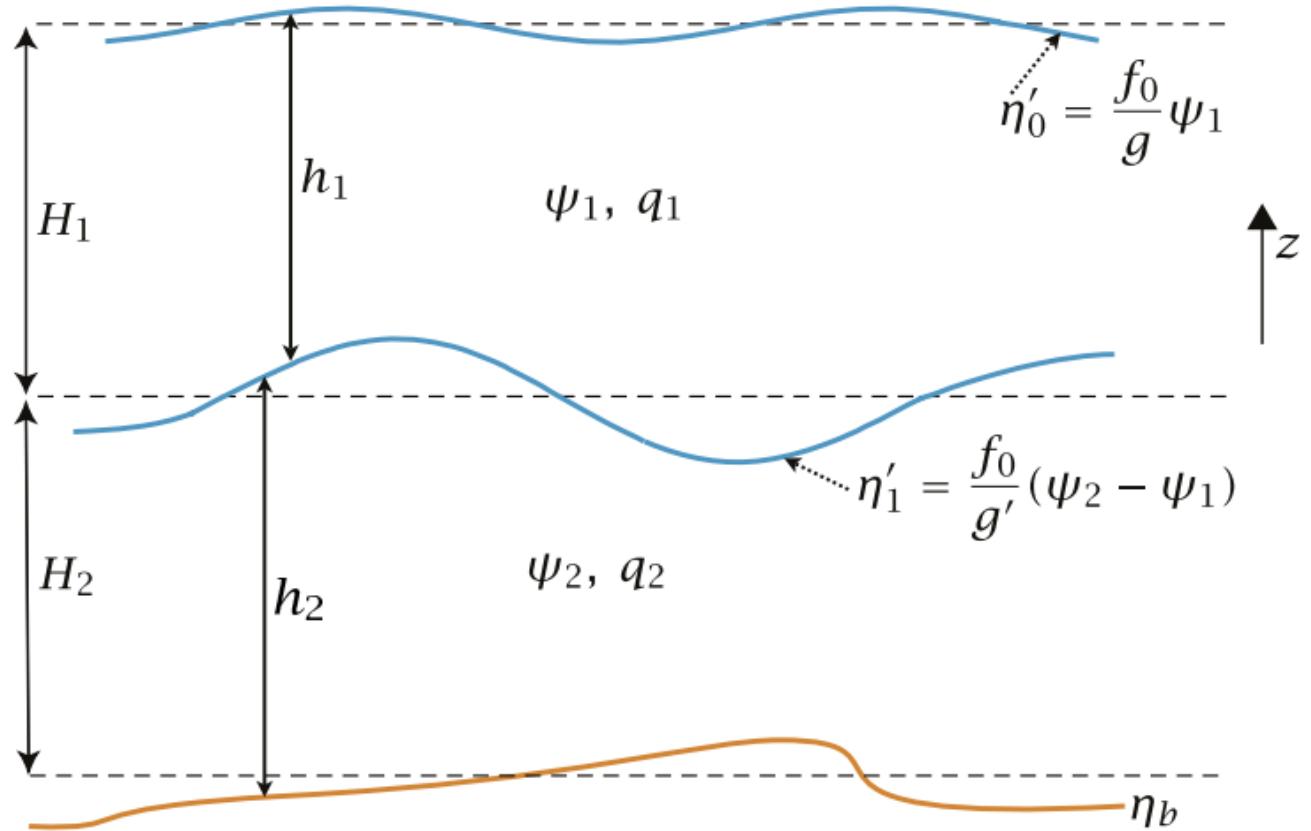


Fig. 5.1

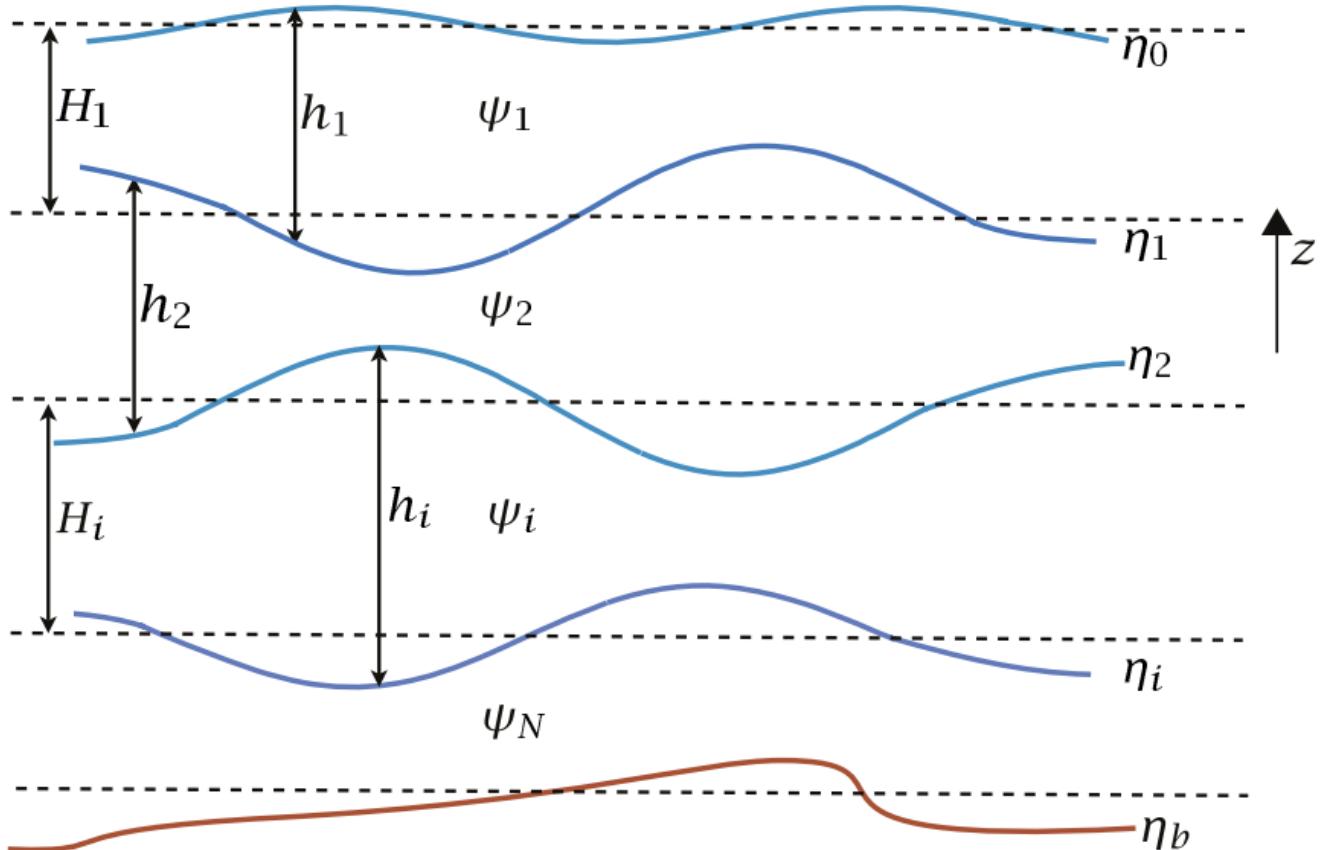


Fig. 5.2

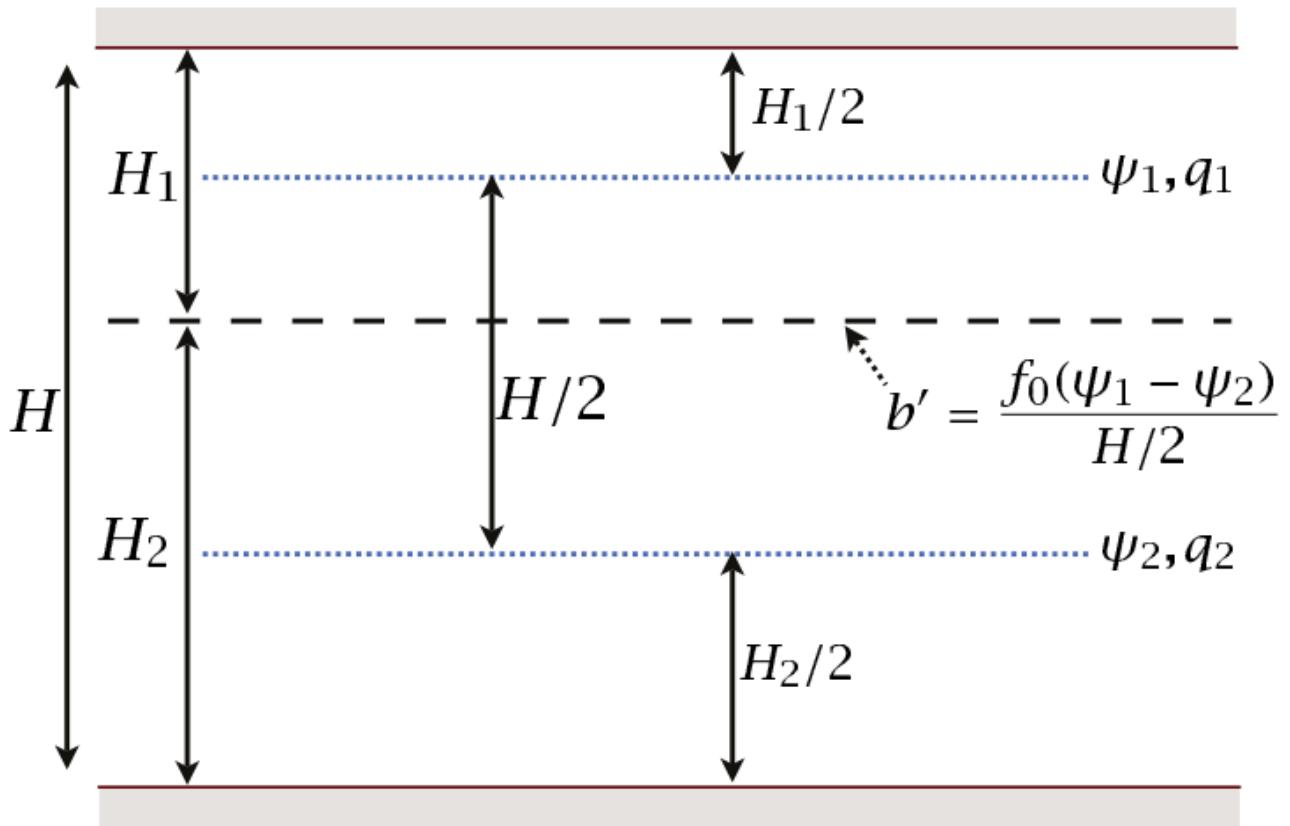


Fig. 5.3

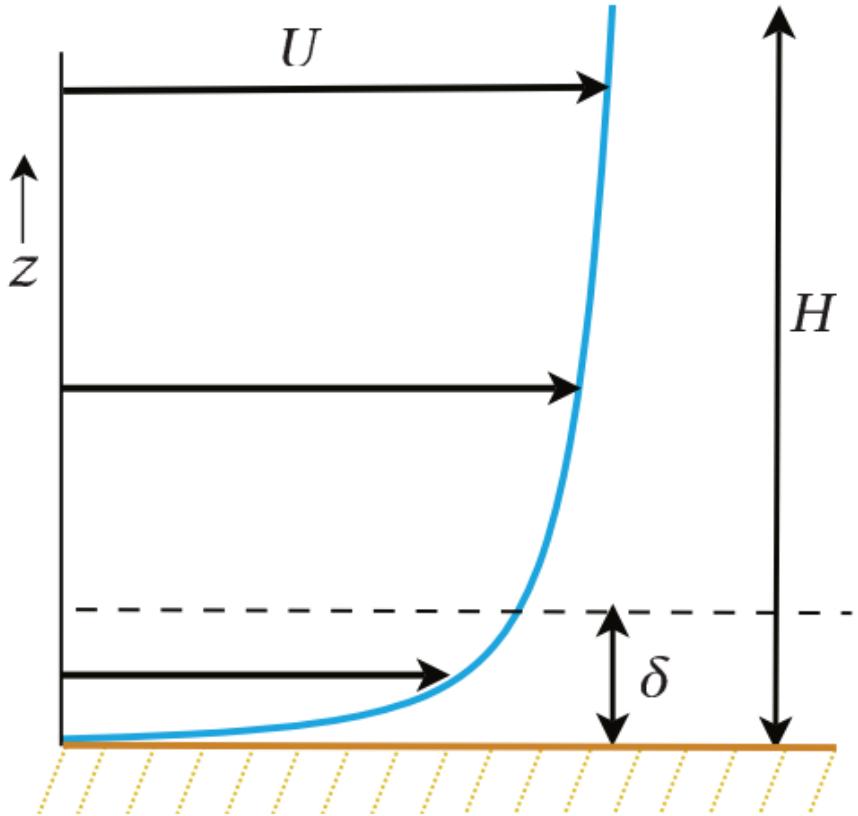


Fig. 5.4

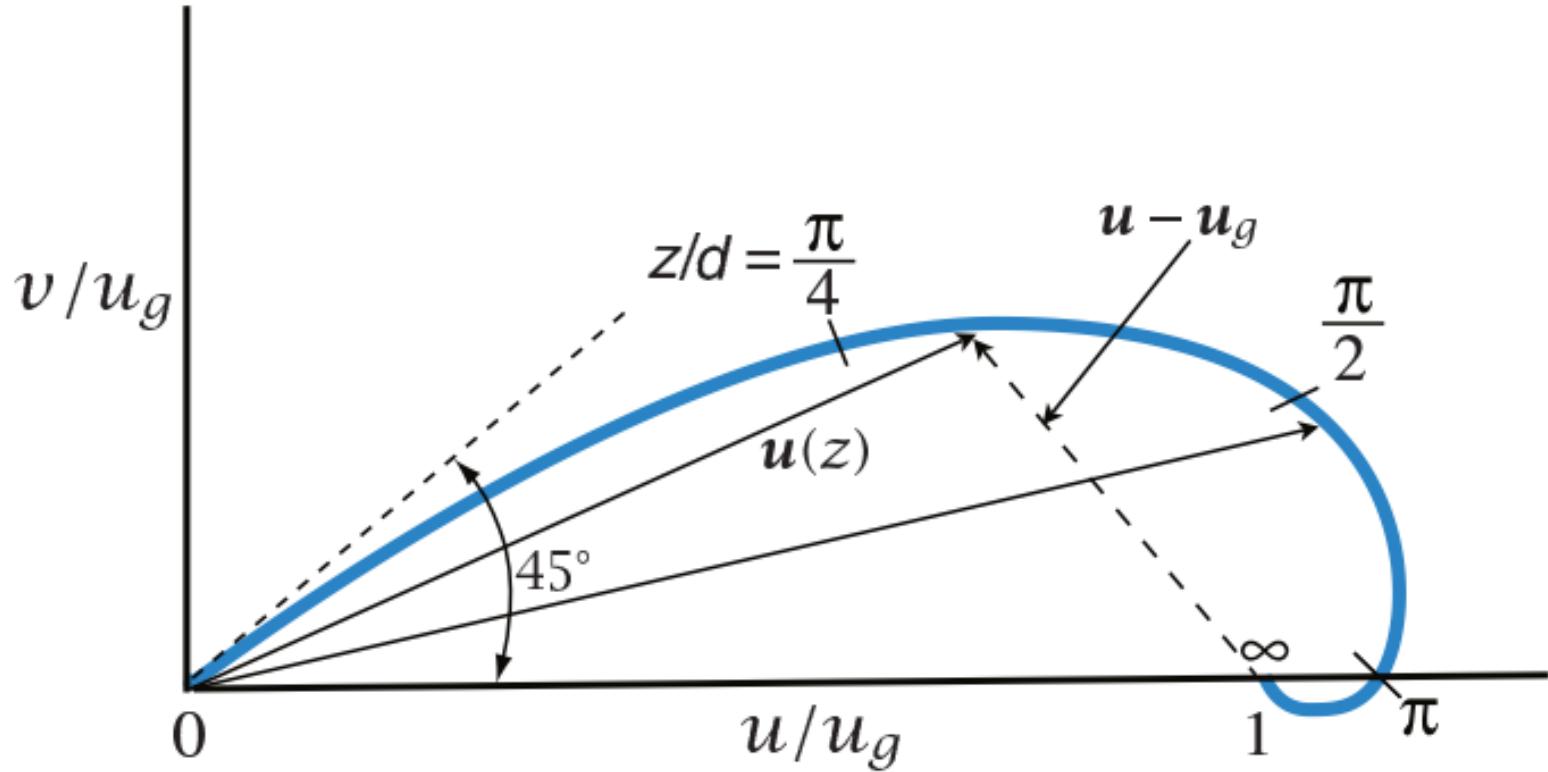


Fig. 5.5

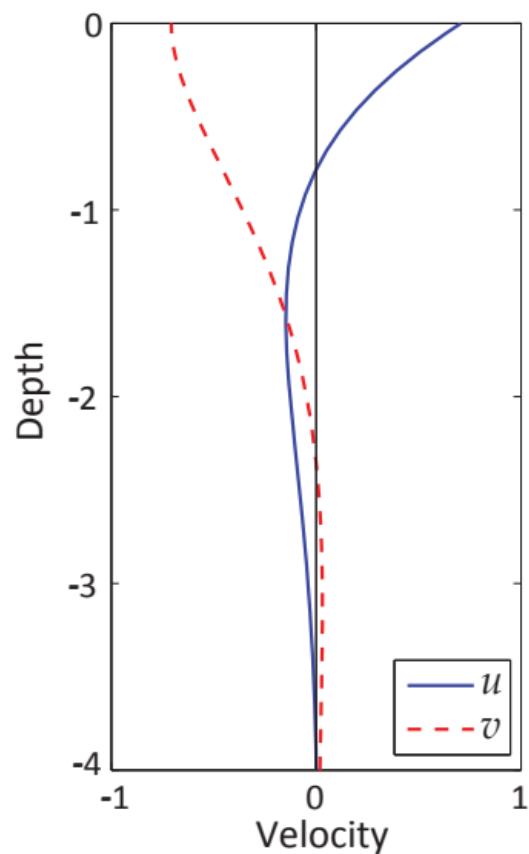
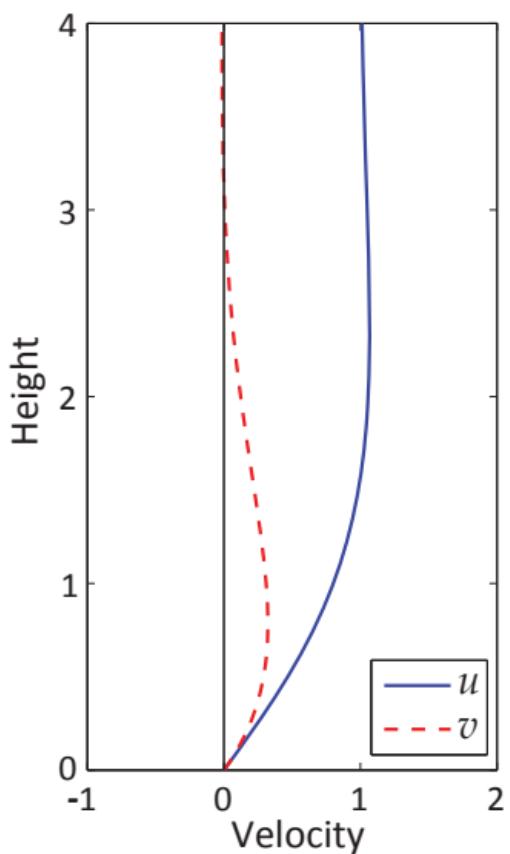


Fig. 5.6

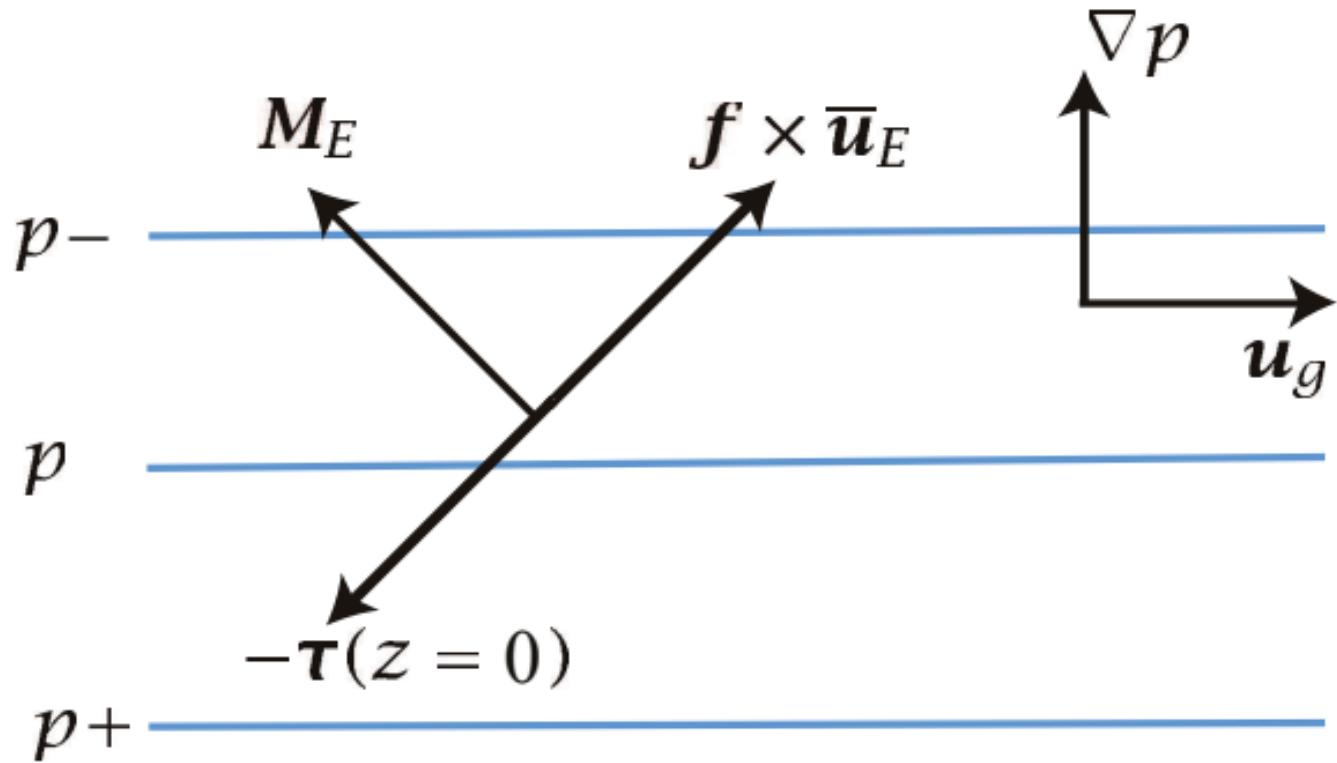


Fig. 5.7

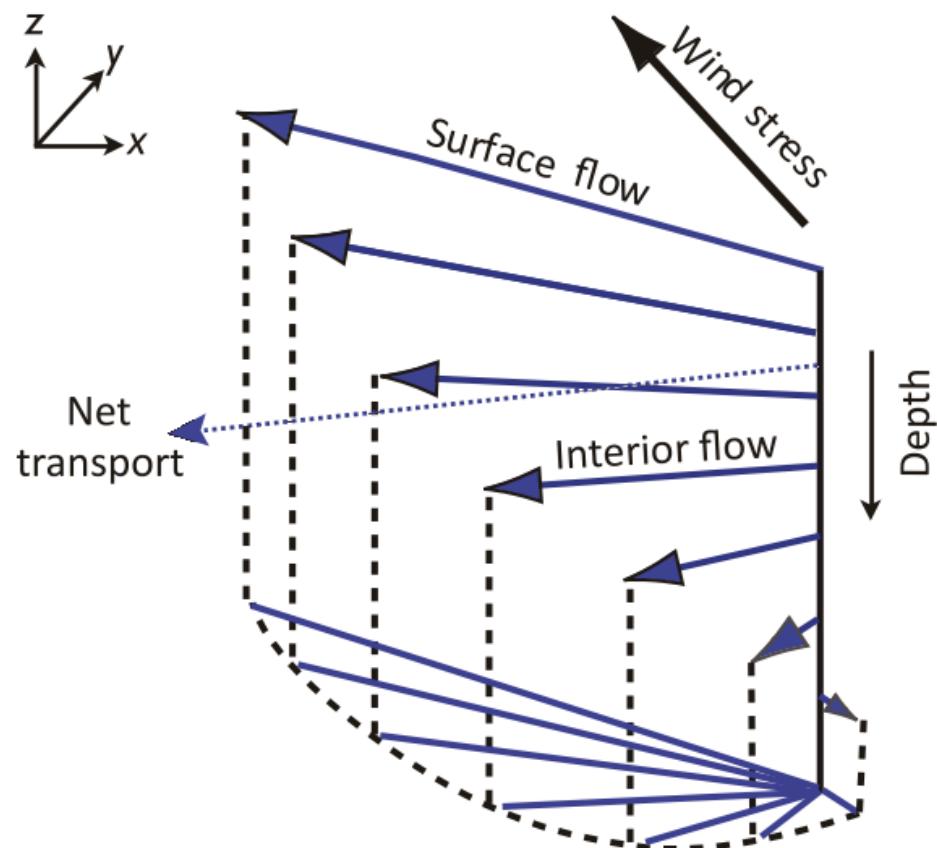


Fig. 5.8

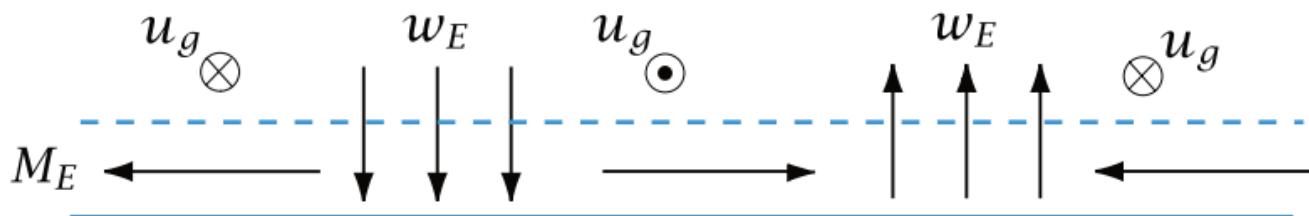
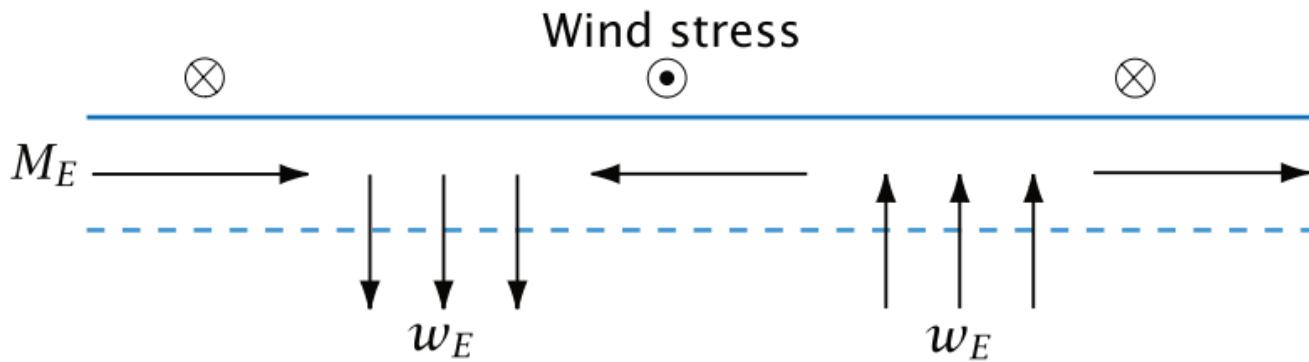


Fig. 5.9

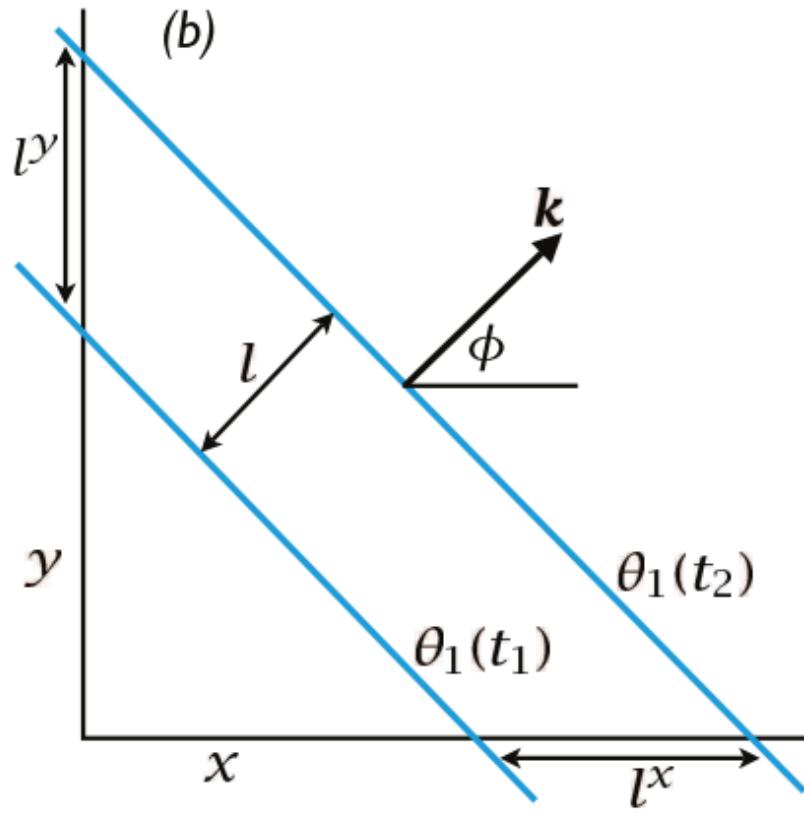
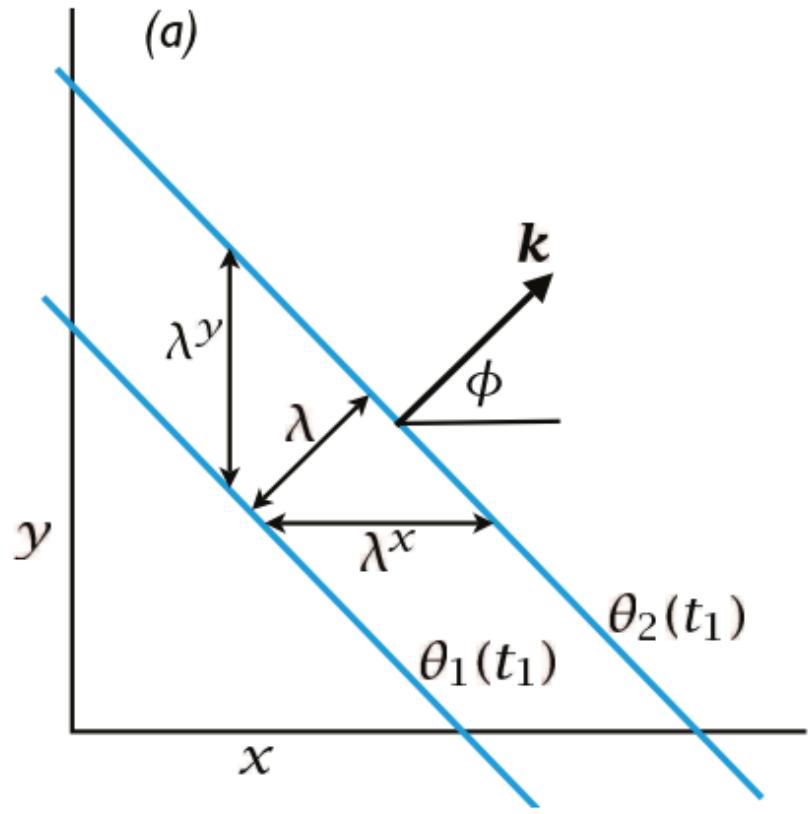


Fig. 6.1

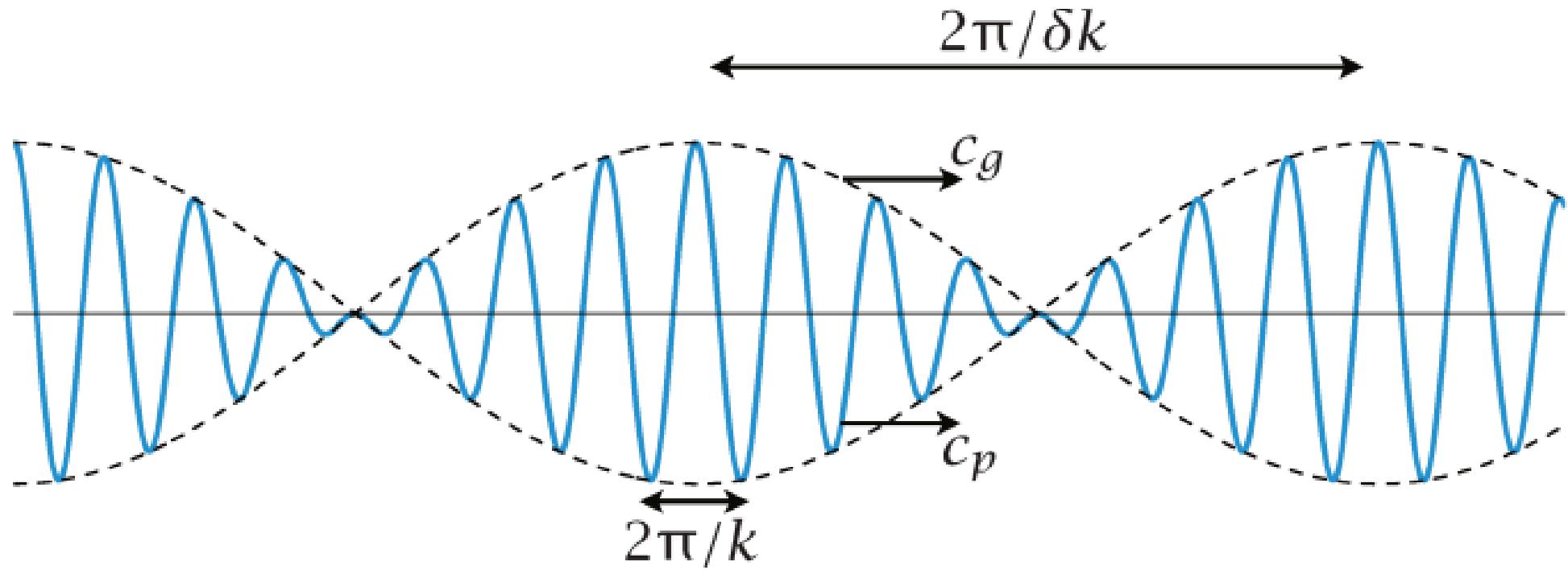


Fig. 6.2

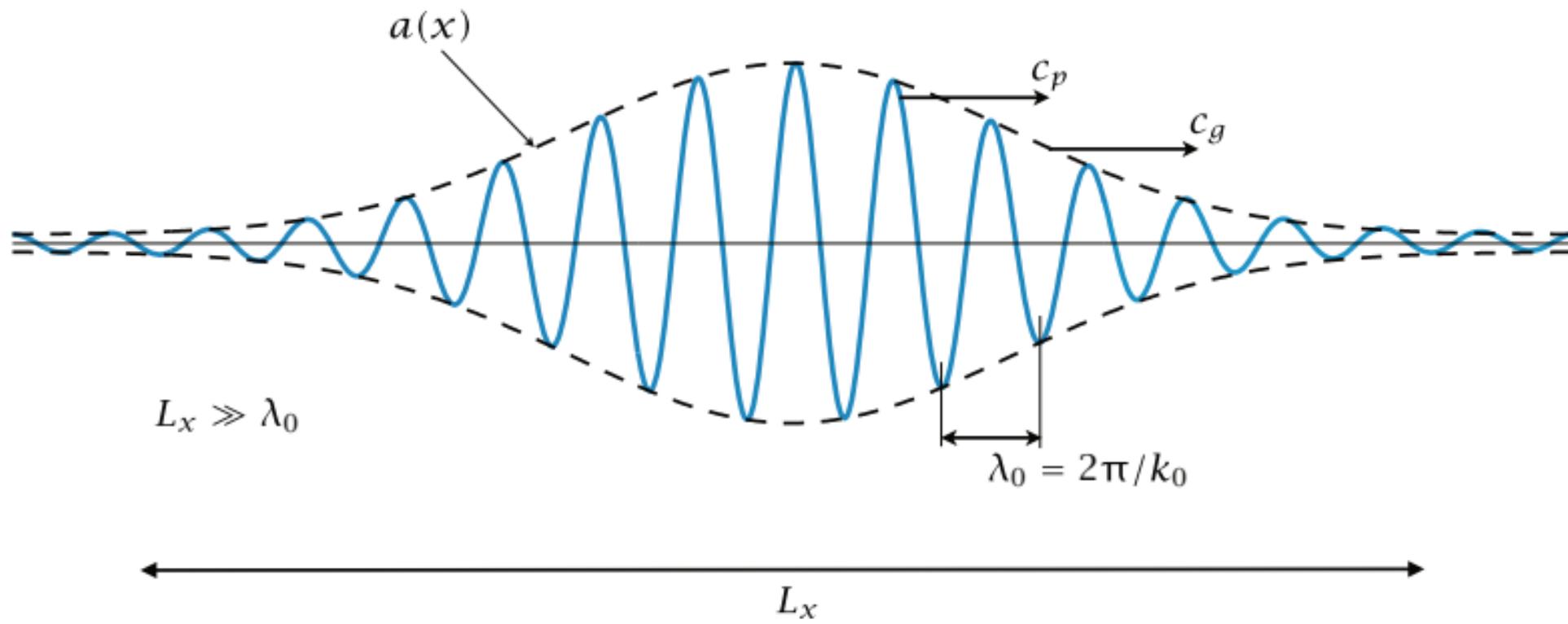


Fig. 6.3

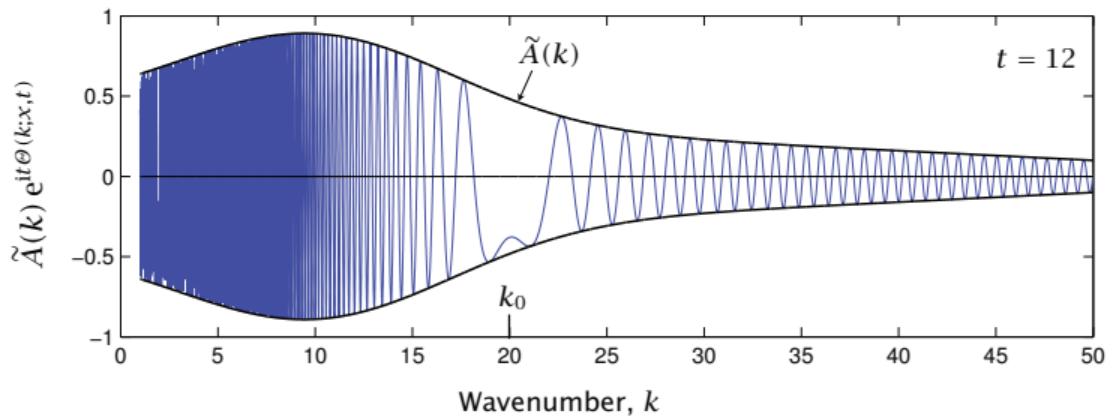
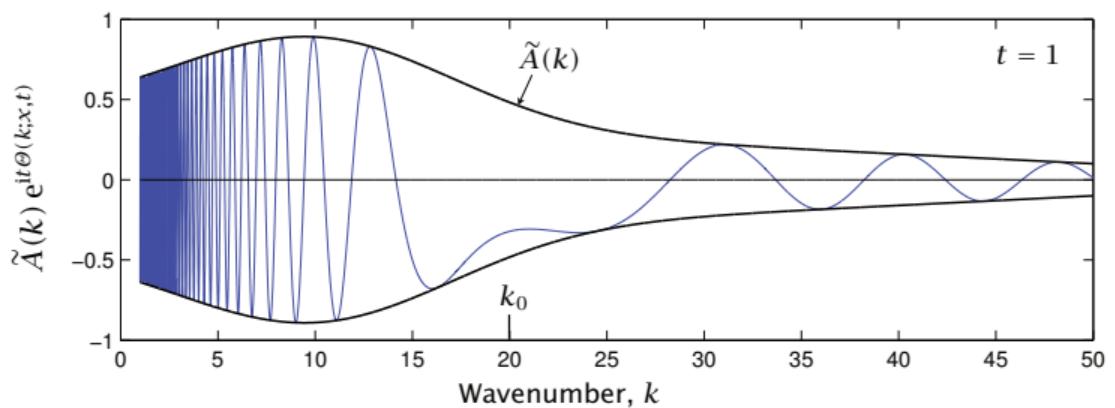


Fig. 6.4

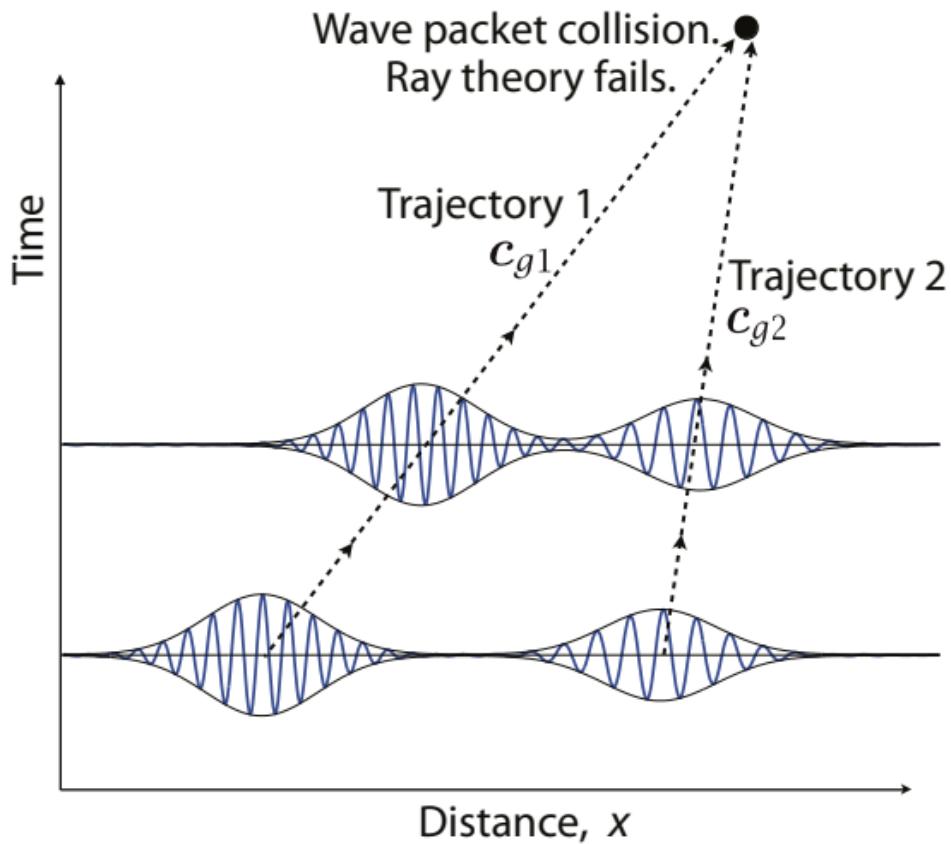


Fig. 6.5

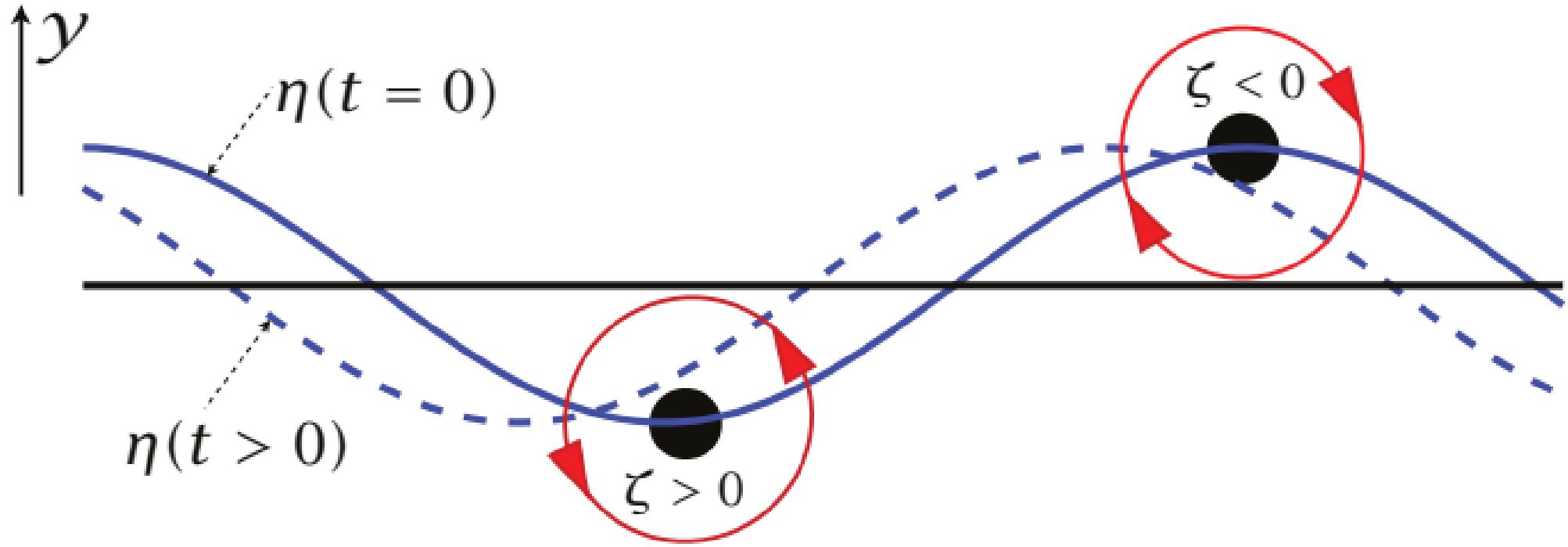


Fig. 6.6

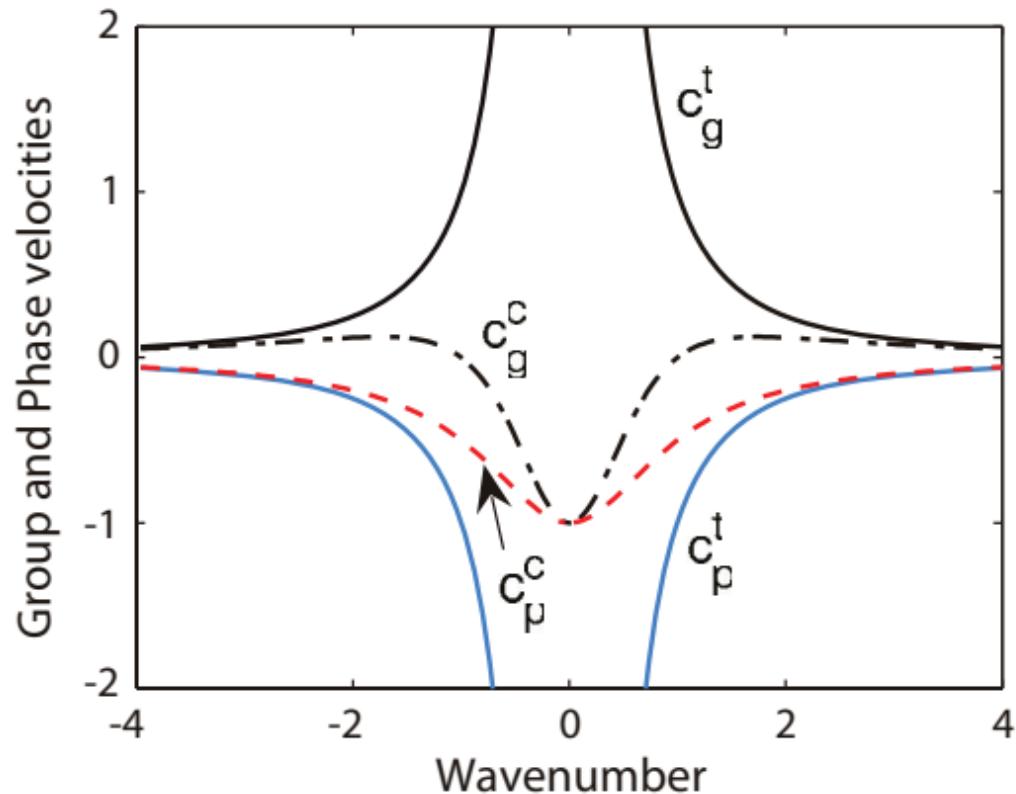
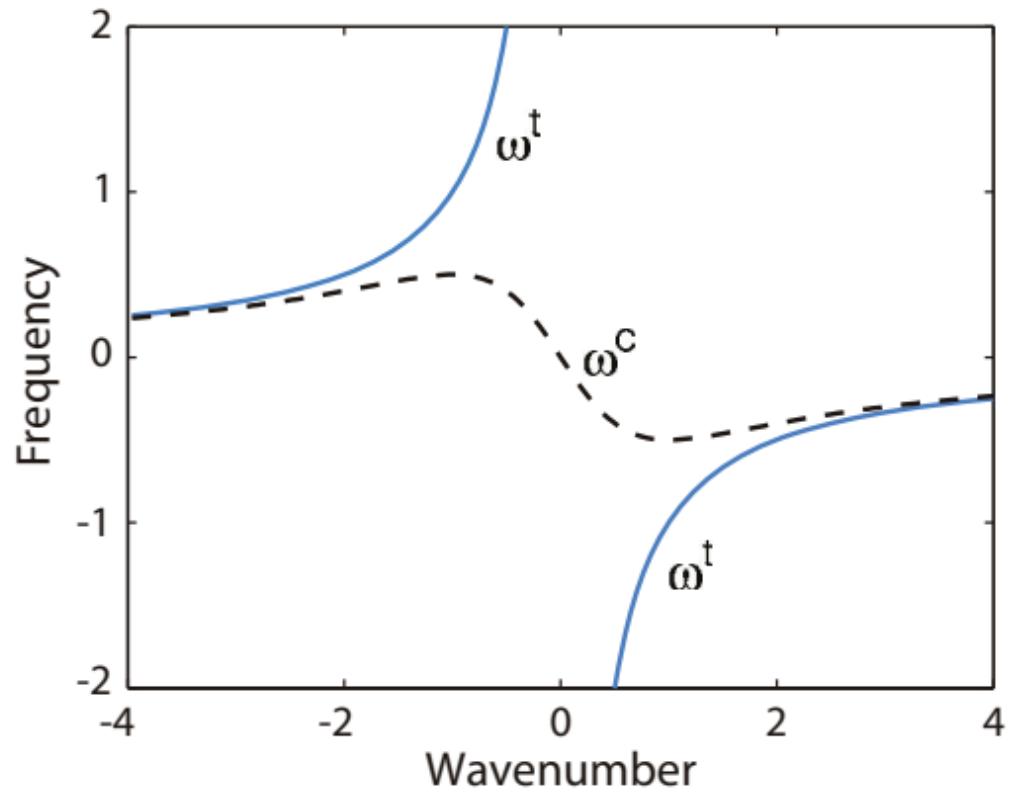
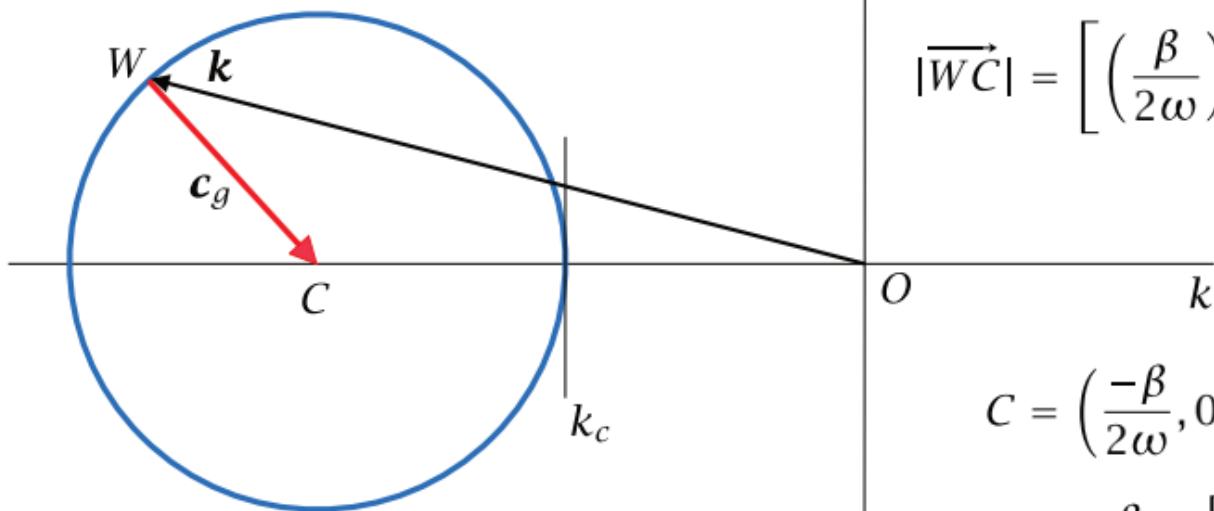


Fig. 6.7



$$|\overrightarrow{WC}| = \left[\left(\frac{\beta}{2\omega} \right)^2 - k_d^2 \right]^{1/2}$$

$$C = \left(\frac{-\beta}{2\omega}, 0 \right)$$

$$k_c = \frac{-\beta}{2\omega} + \left[\left(\frac{\beta}{2\omega} \right)^2 - k_d^2 \right]^{1/2}$$

Fig. 6.8

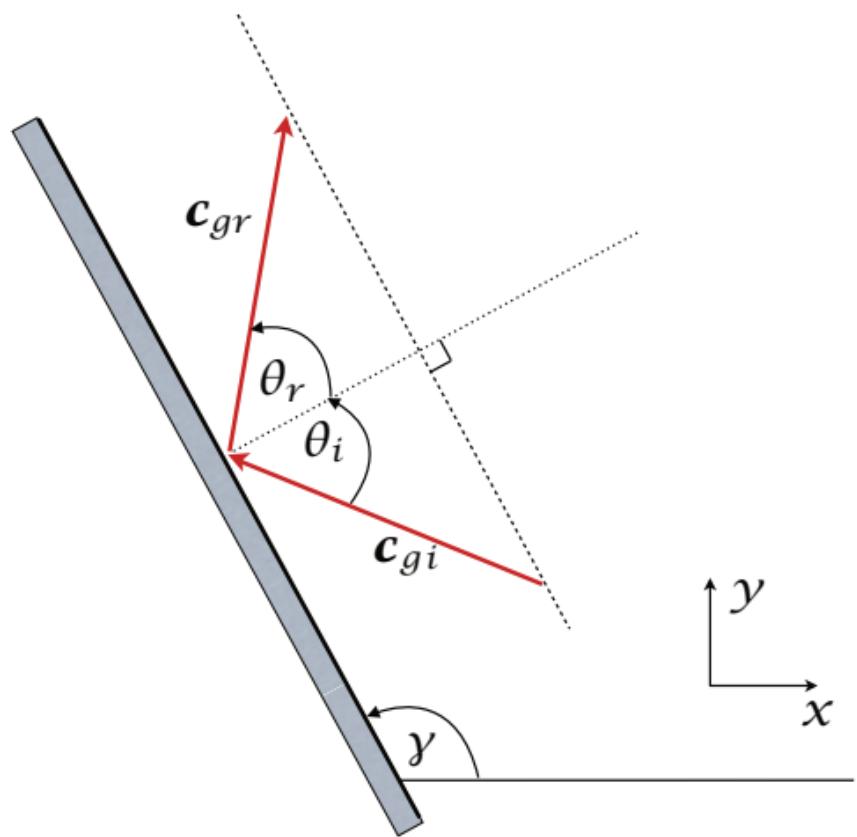


Fig. 6.9

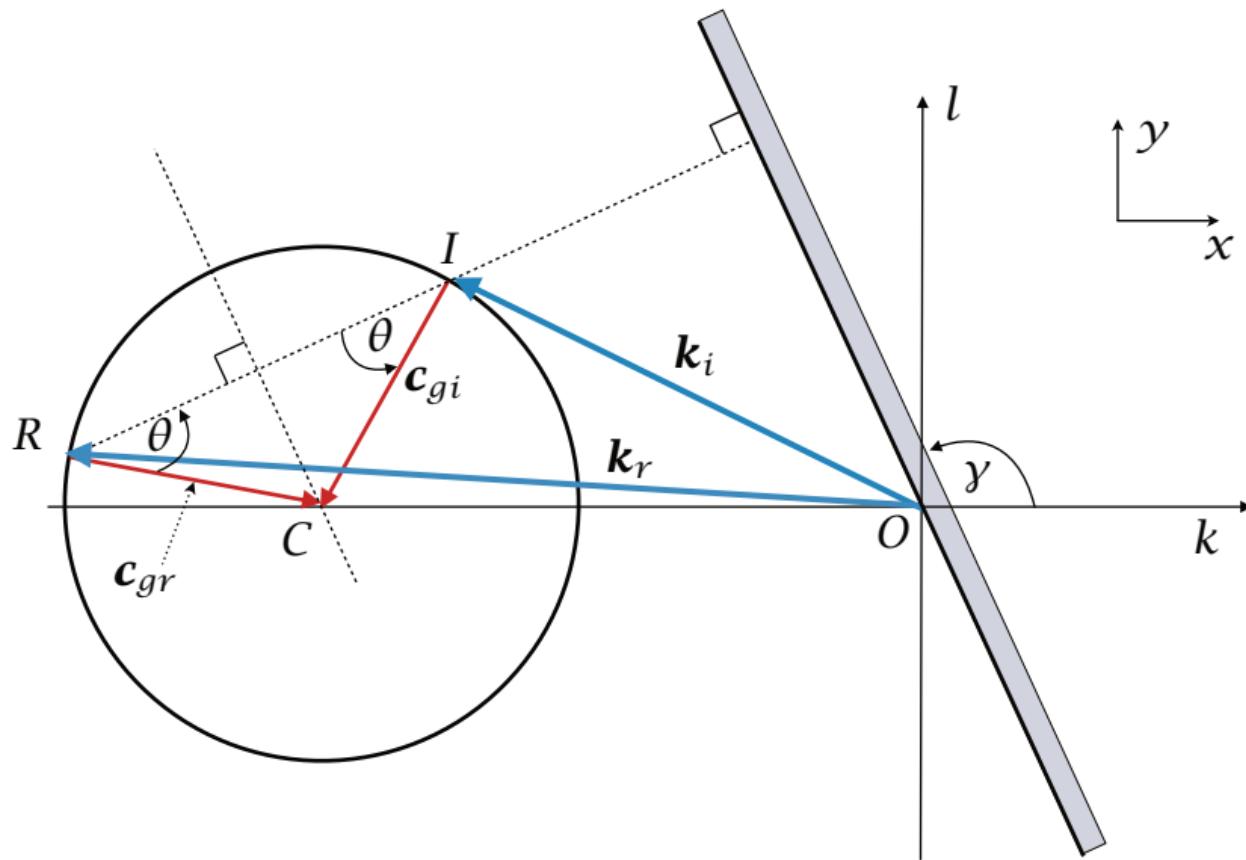


Fig. 6.10

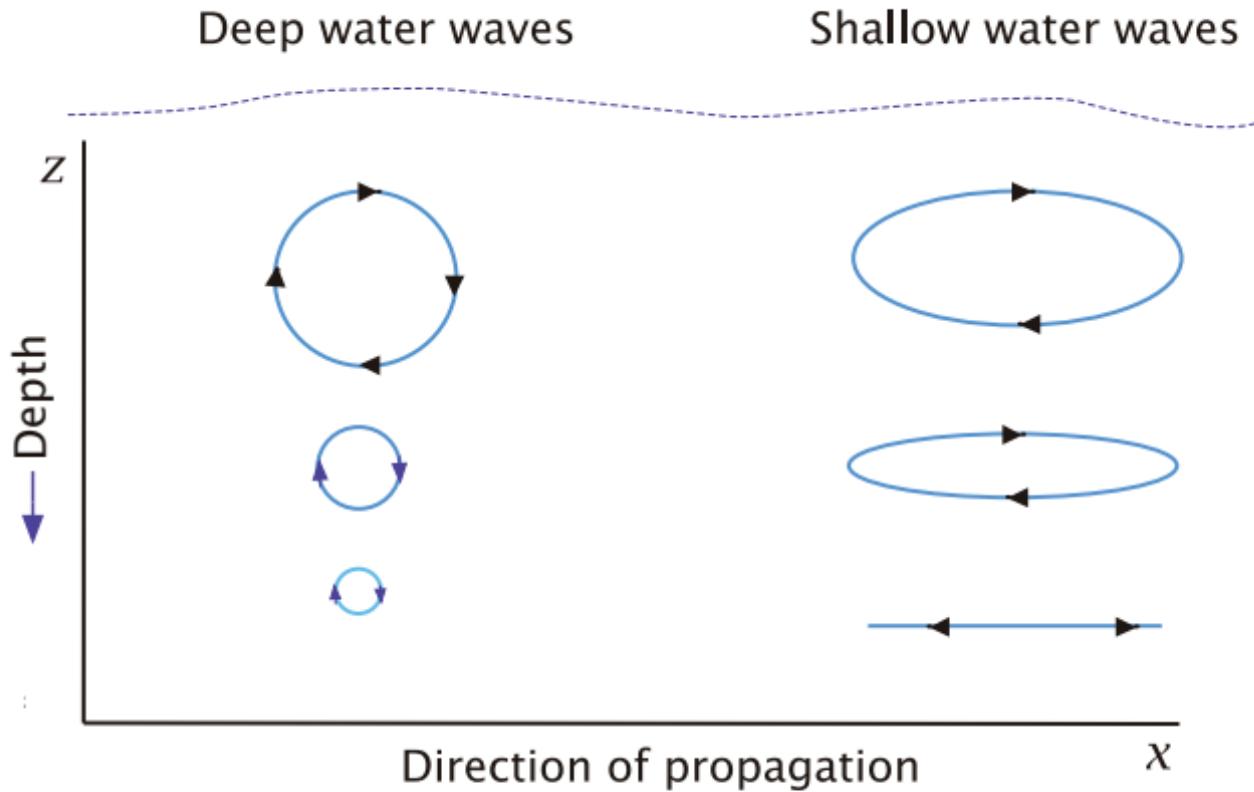


Fig. 7.1

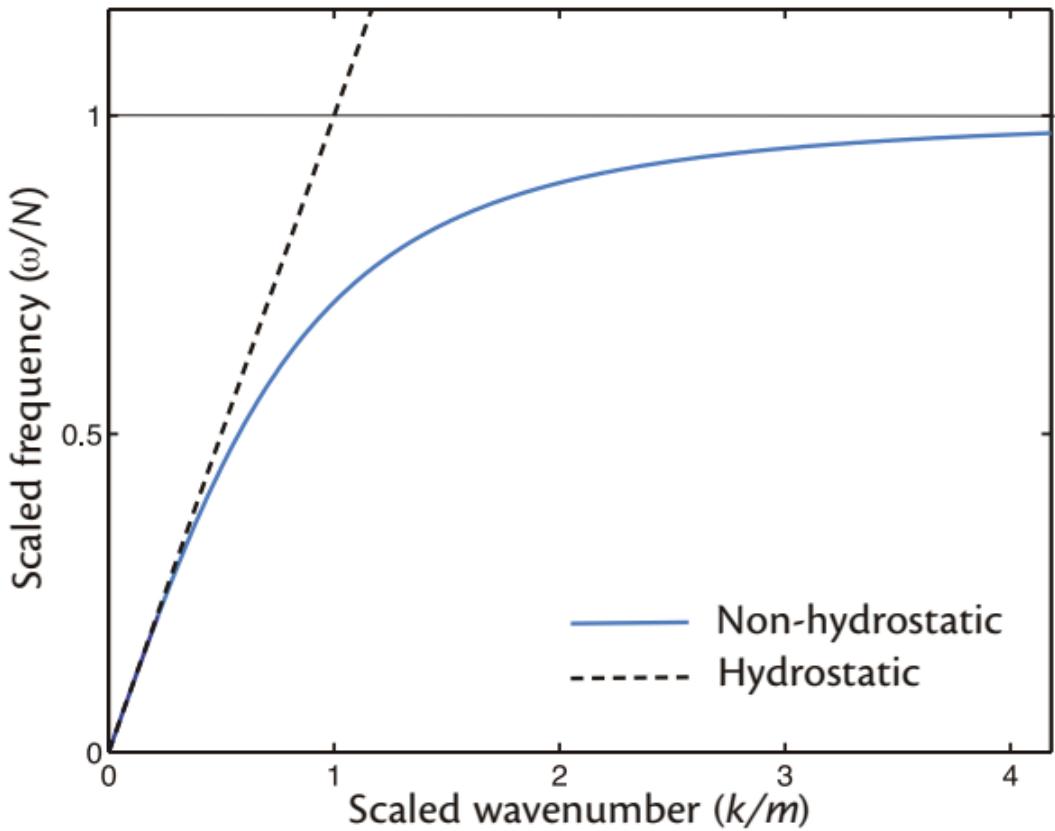


Fig. 7.2

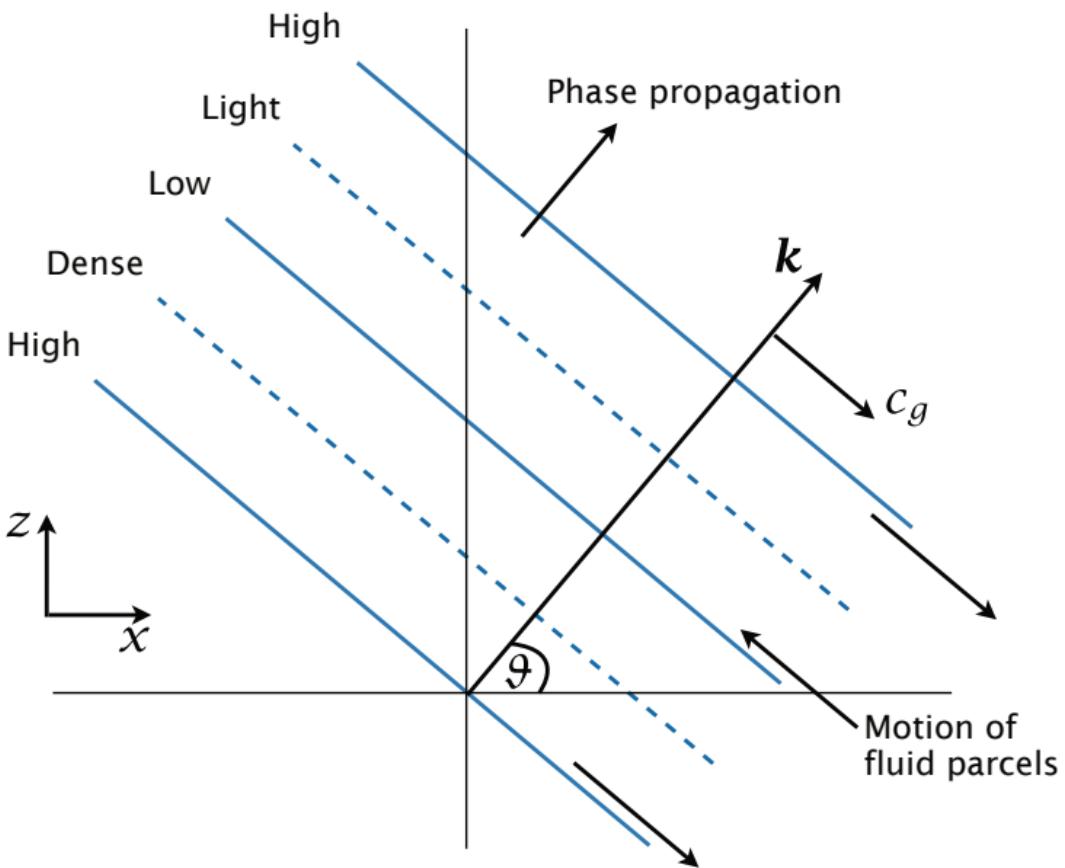


Fig. 7.3

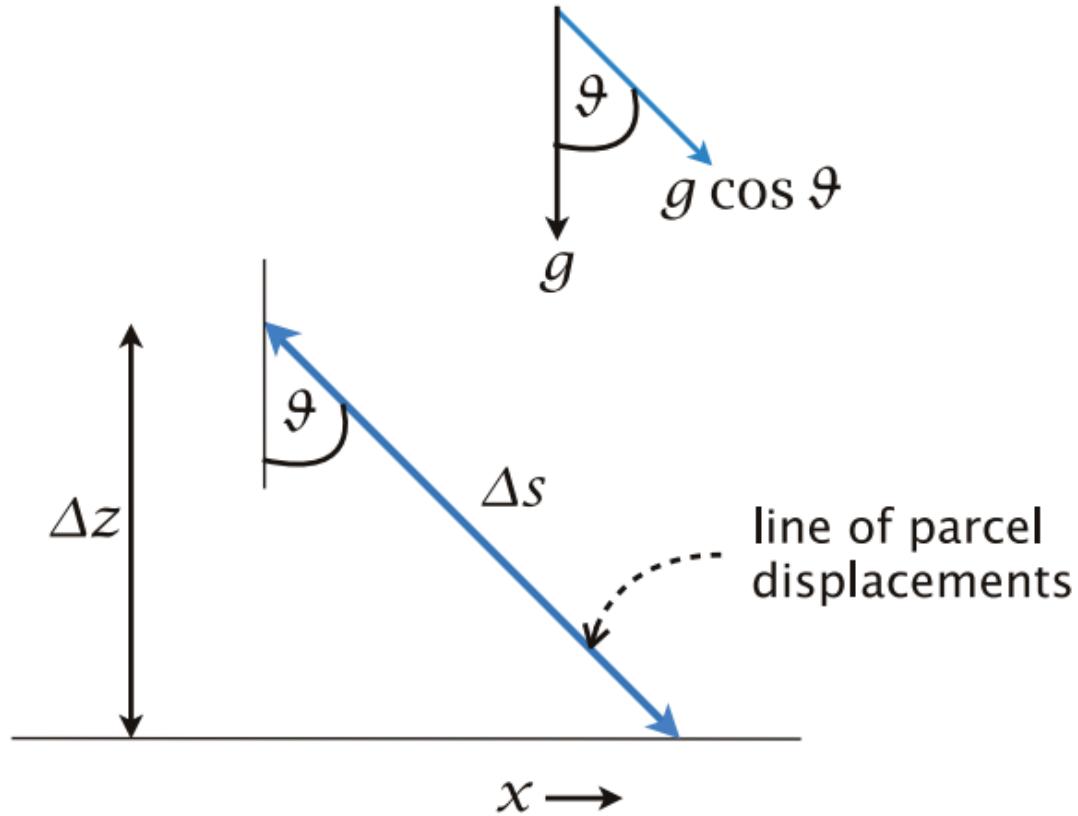


Fig. 7.4

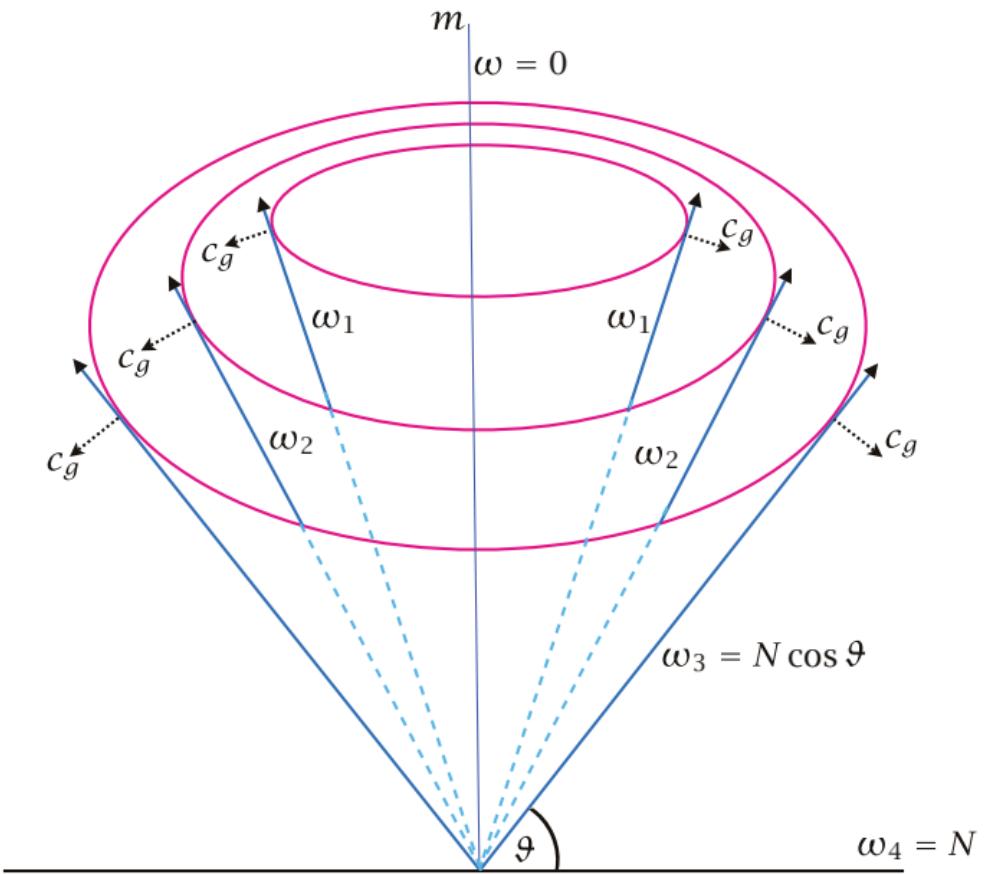


Fig. 7.5

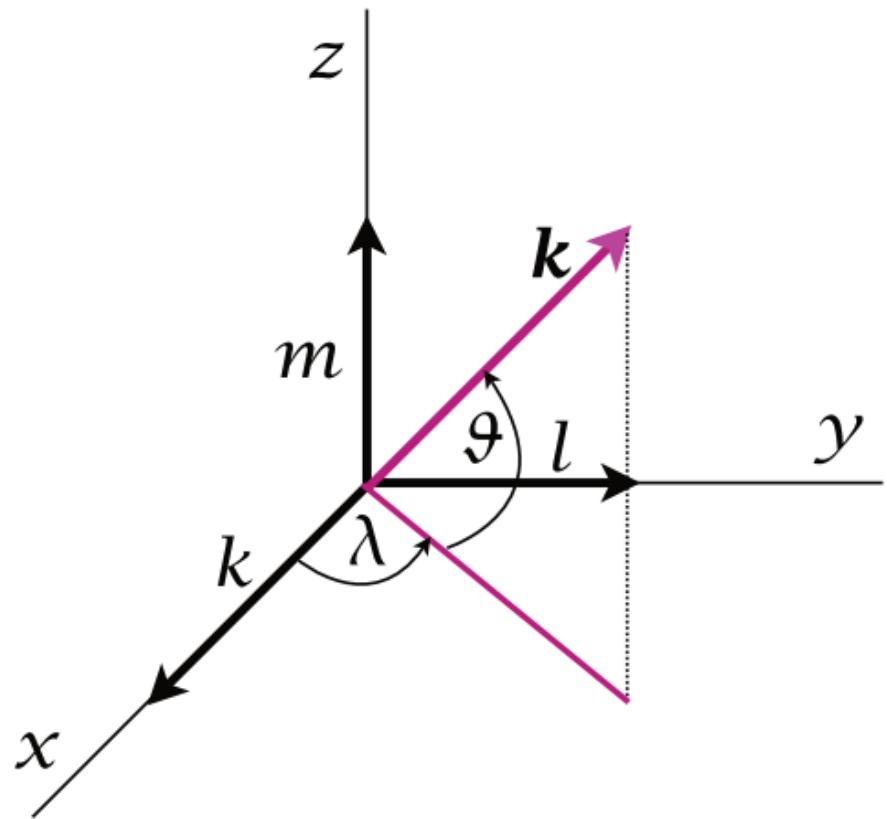


Fig. 7.6

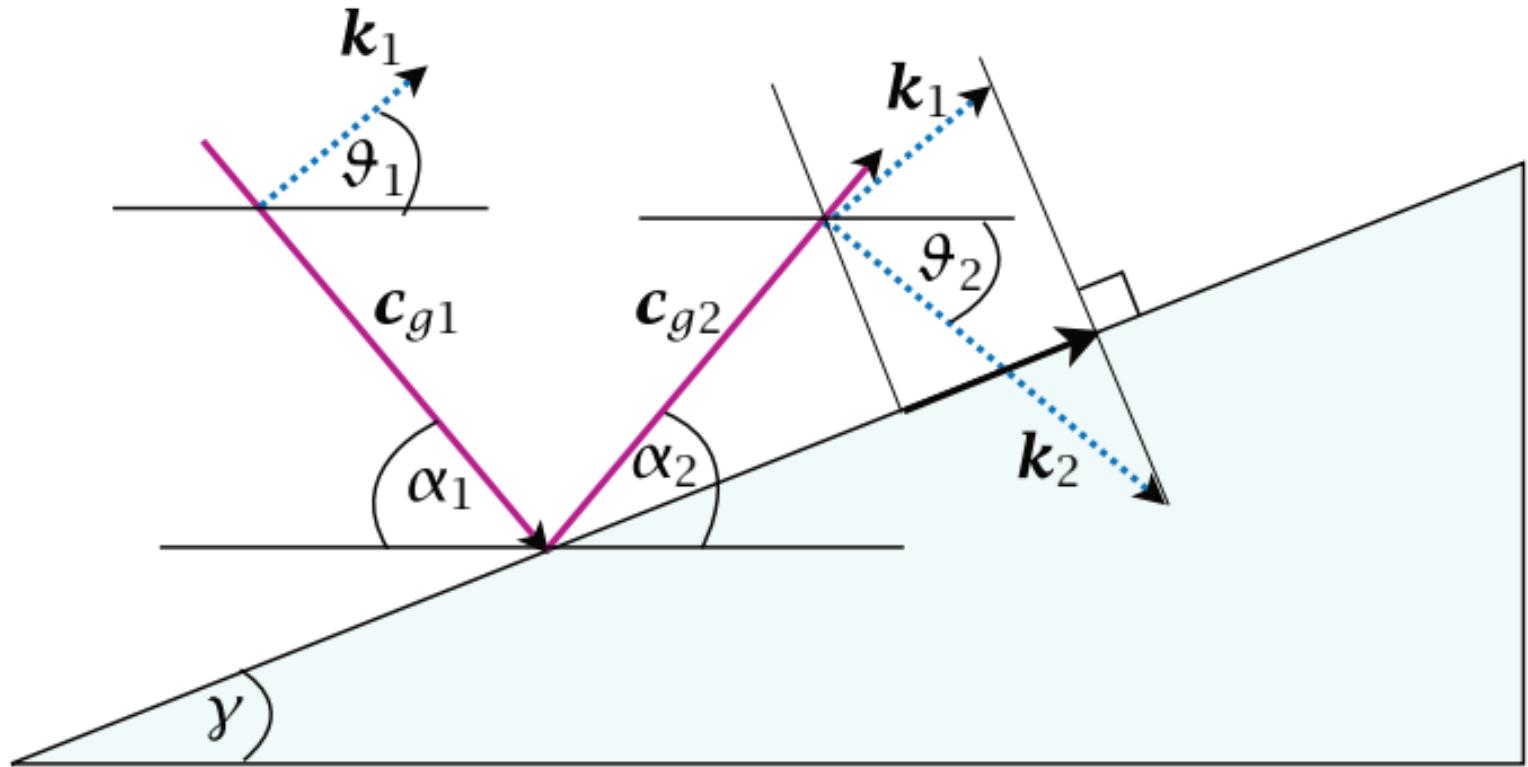


Fig. 7.7

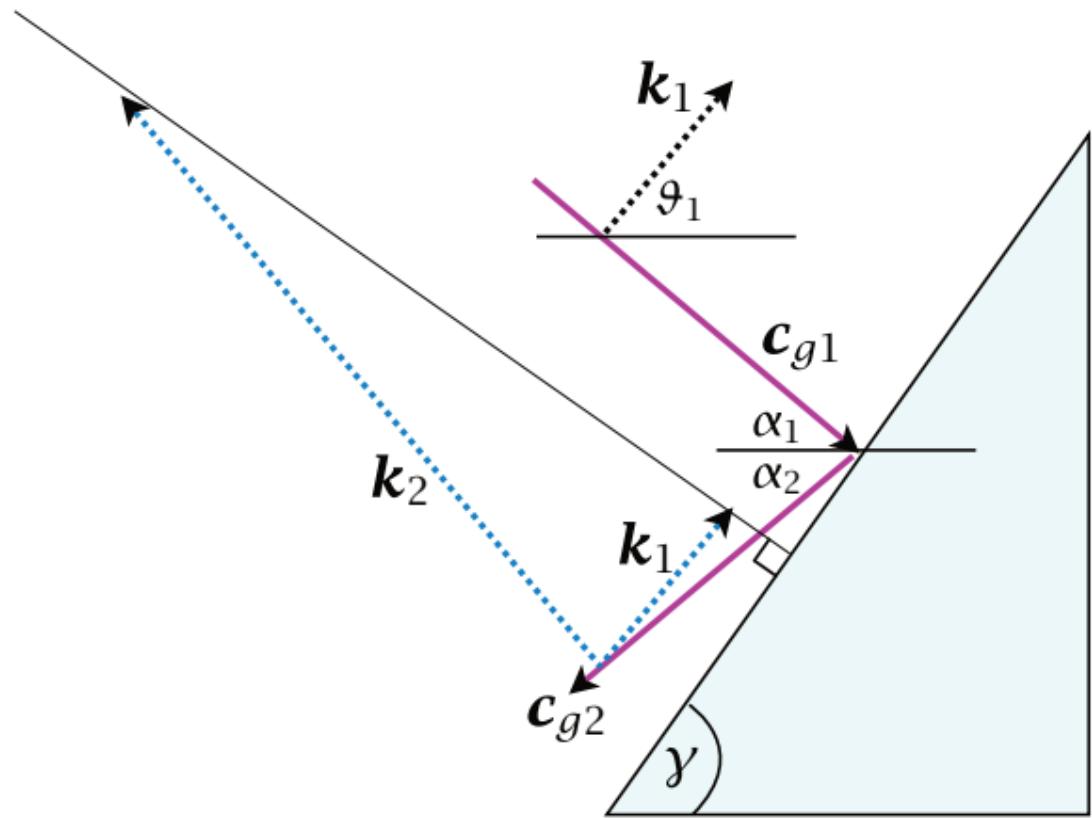


Fig. 7.8

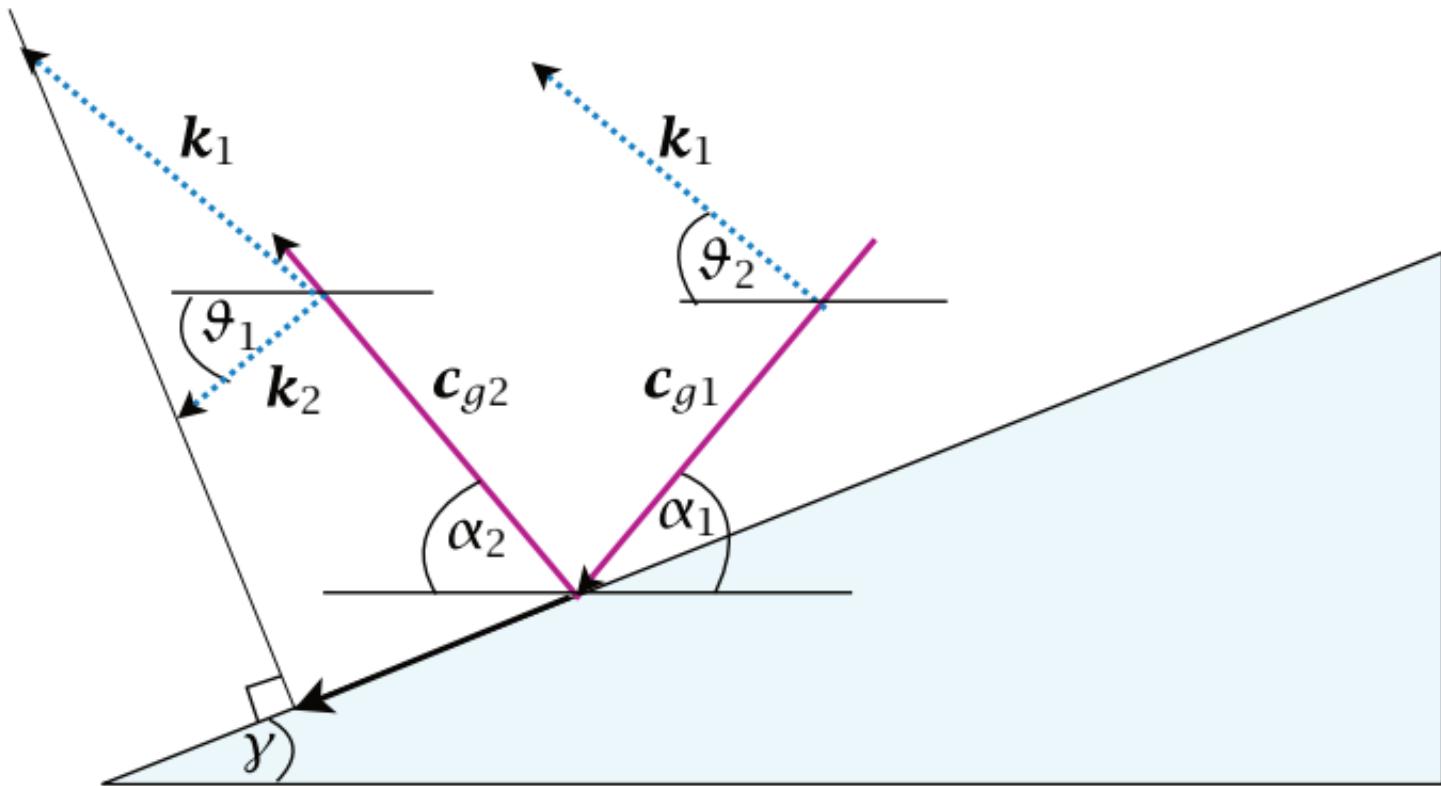
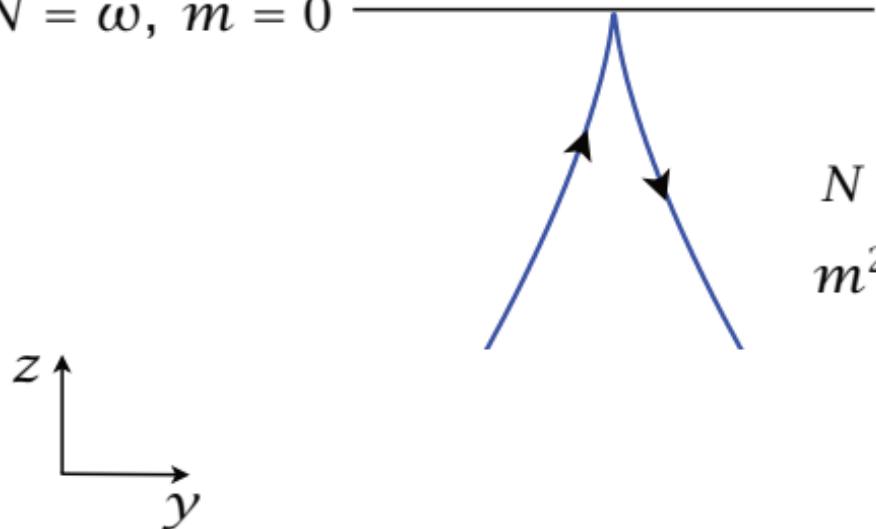


Fig. 7.9

$$N < \omega, m^2 < 0$$

$$N = \omega, m = 0$$



$$\begin{aligned}N &> \omega \\m^2 &> 0\end{aligned}$$

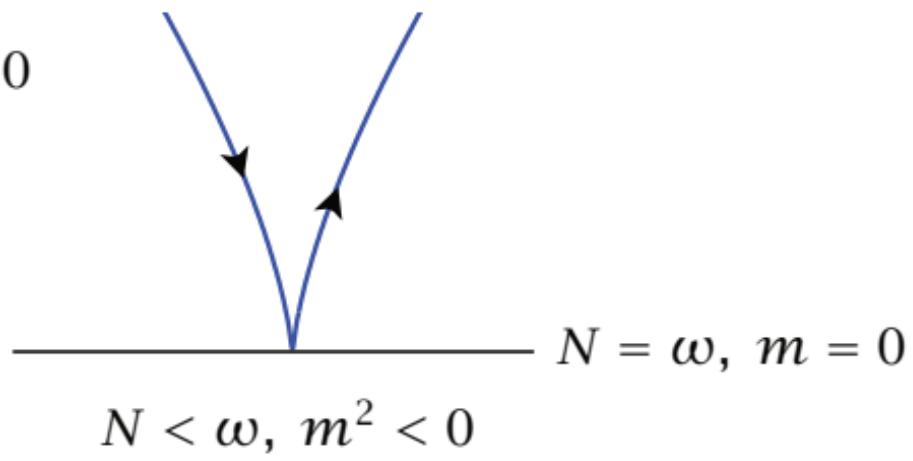


Fig. 7.10

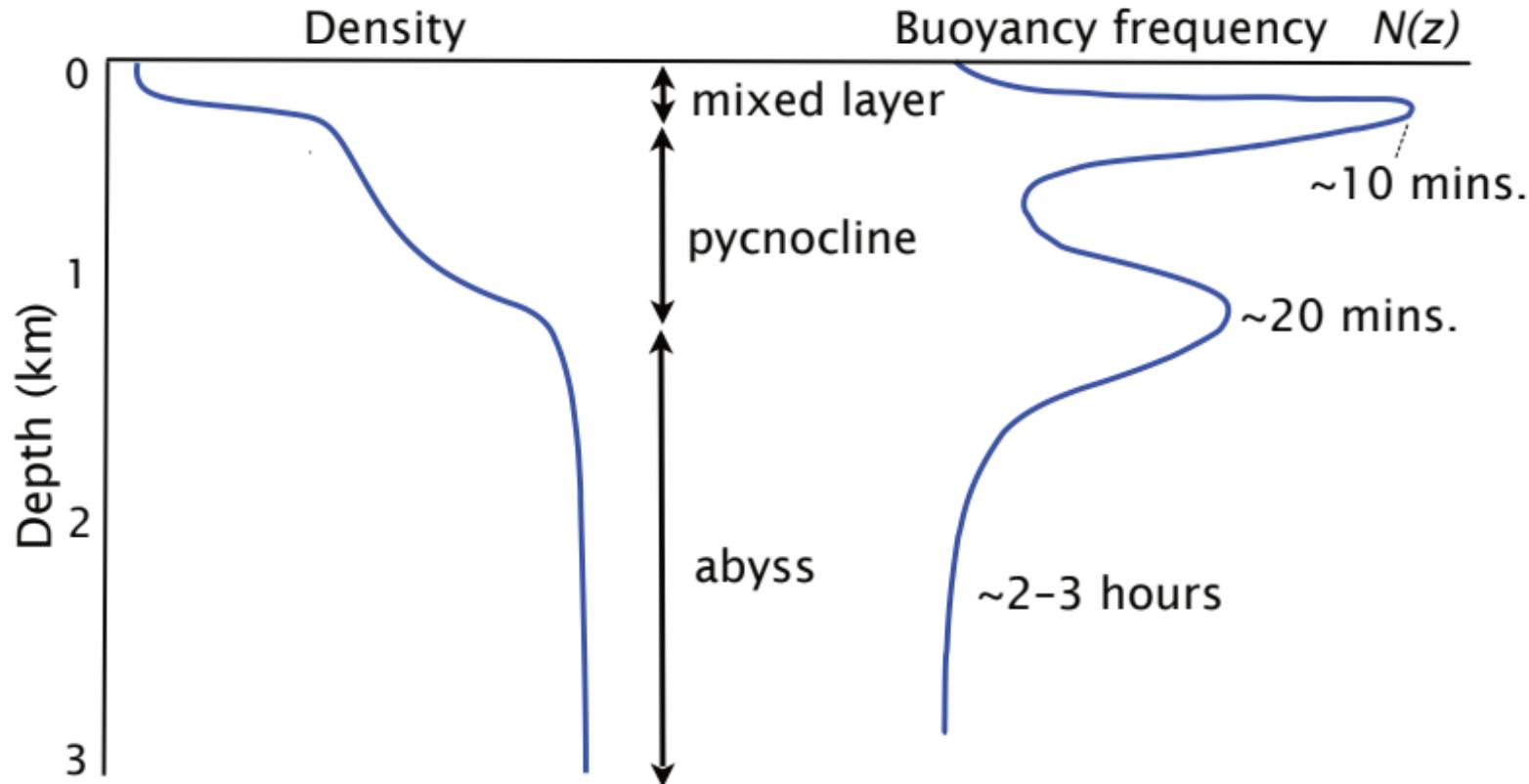


Fig. 7.11

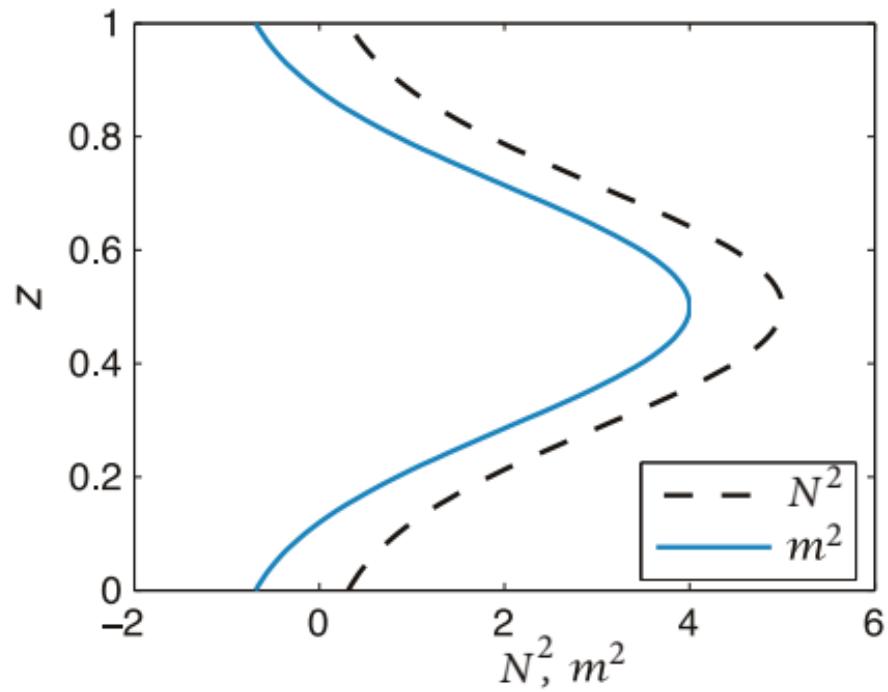
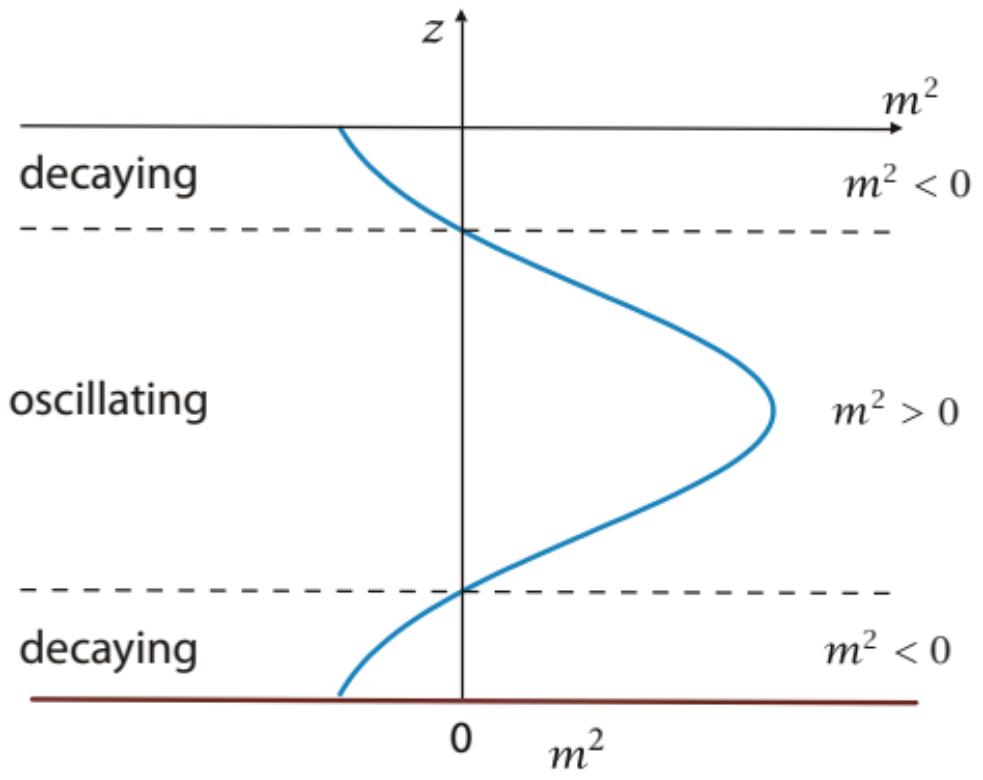


Fig. 7.12

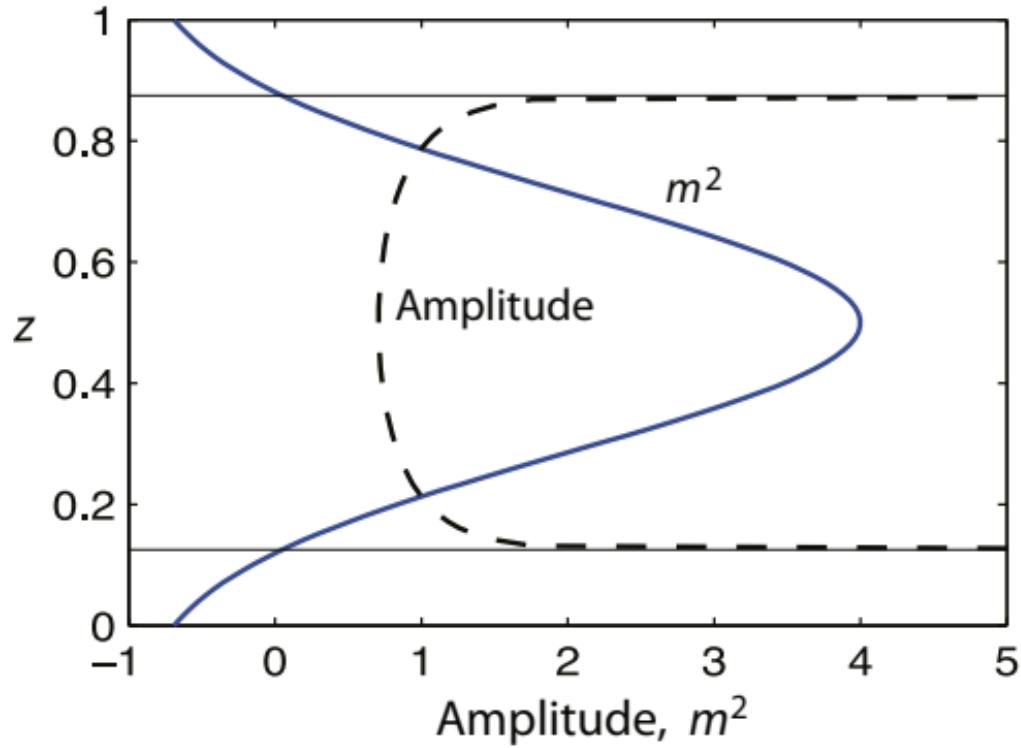
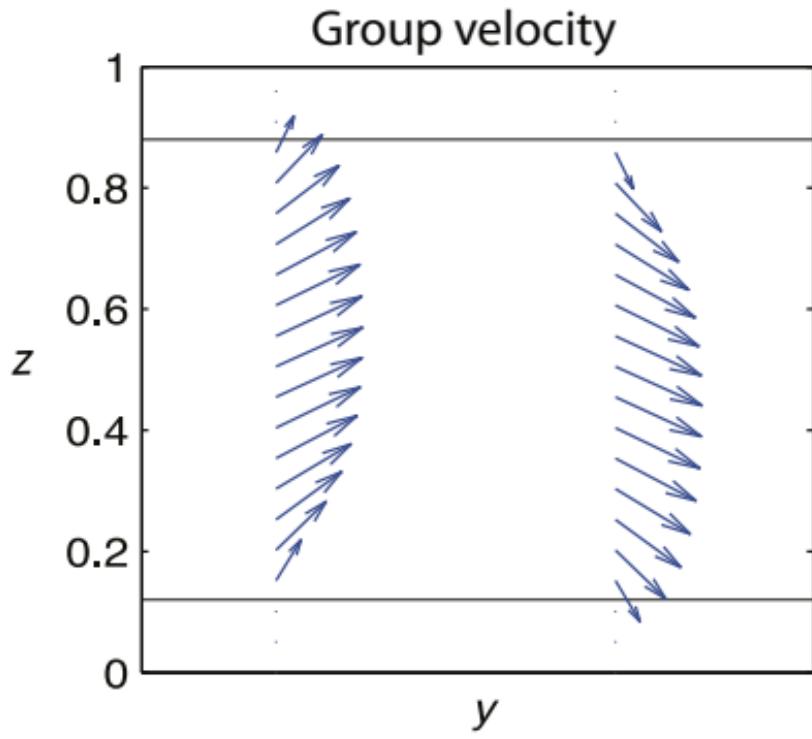


Fig. 7.13

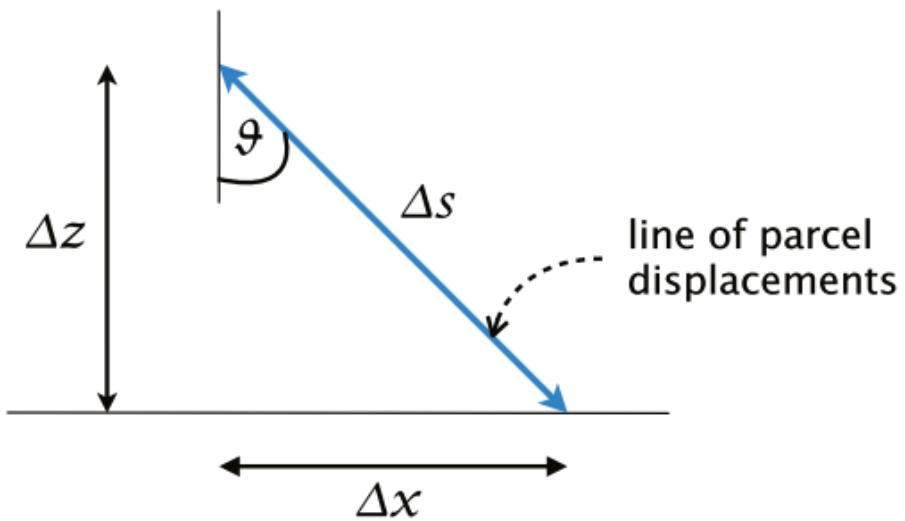
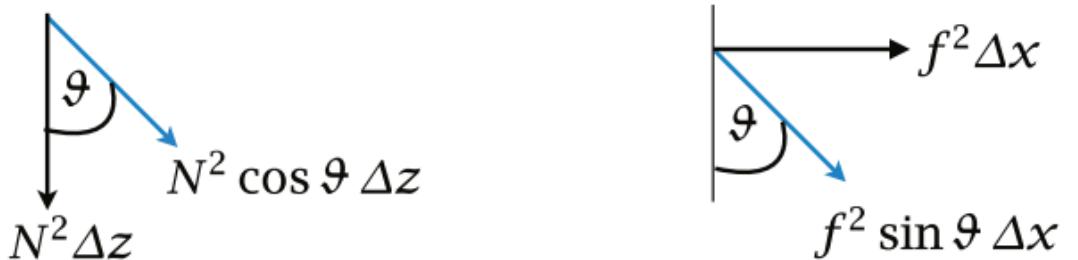


Fig. 7.14

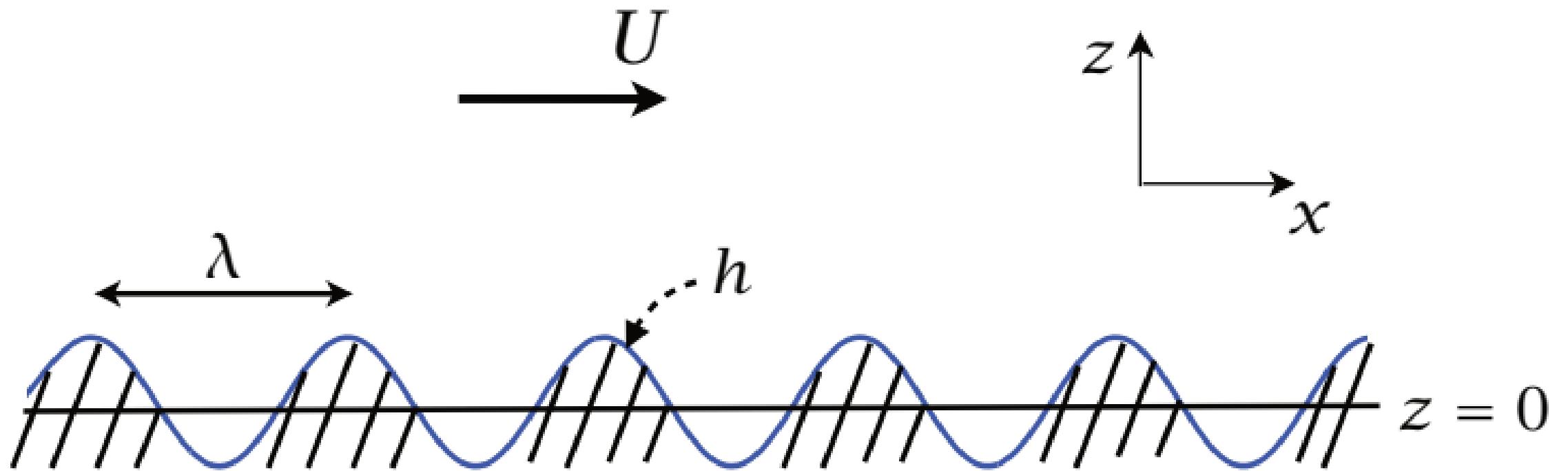


Fig. 7.15

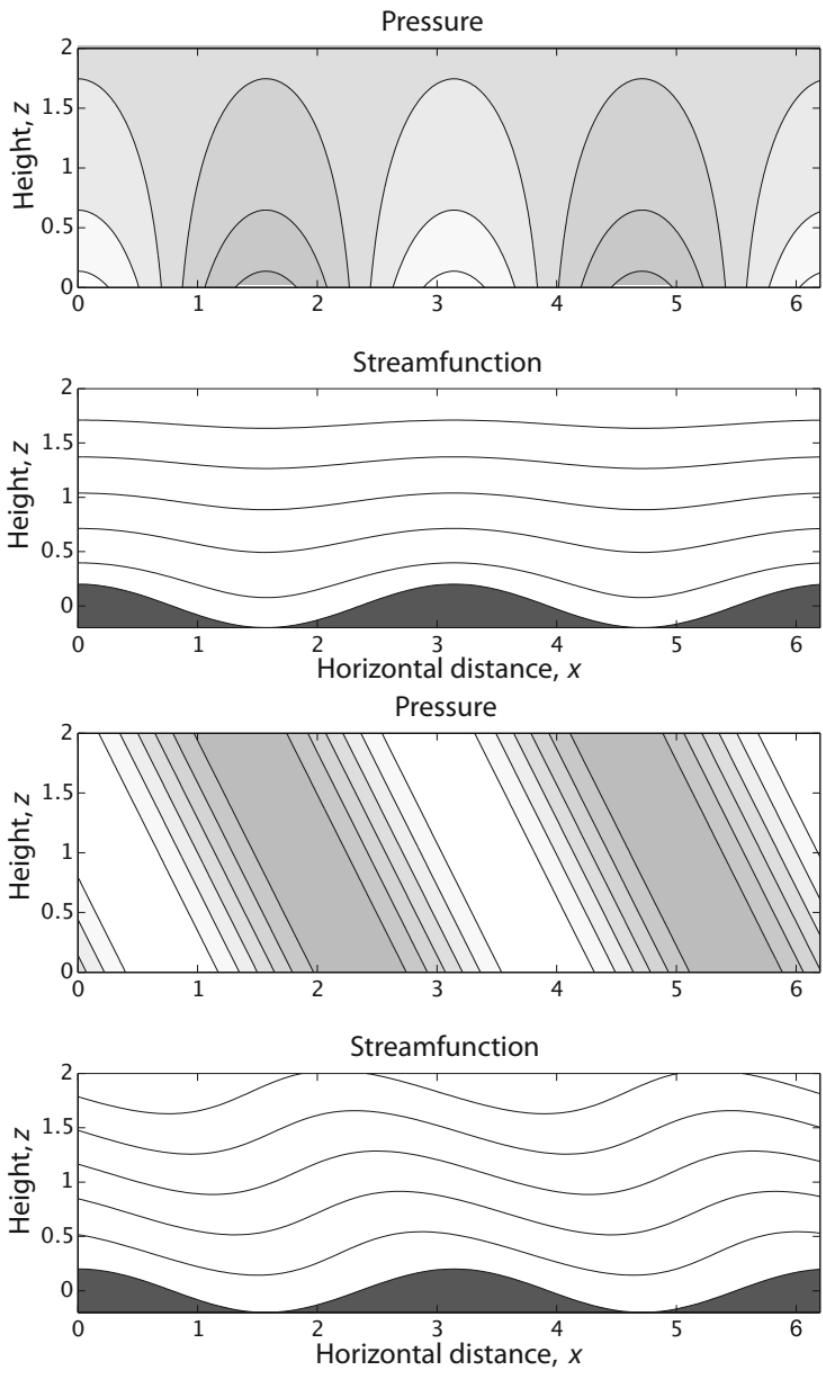


Fig. 7.16

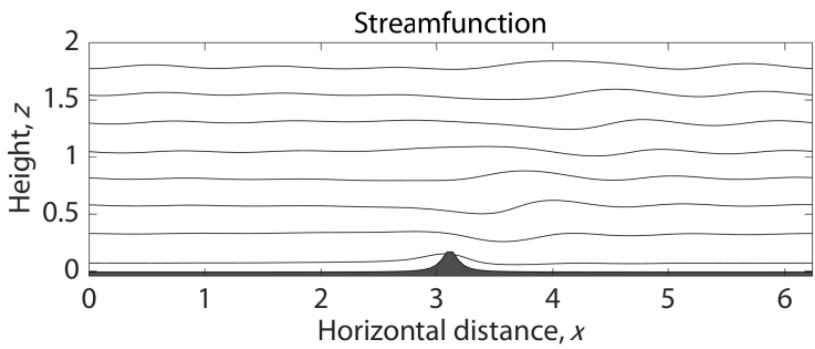
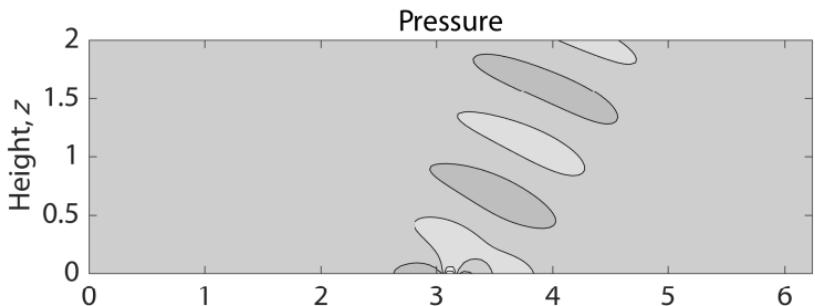
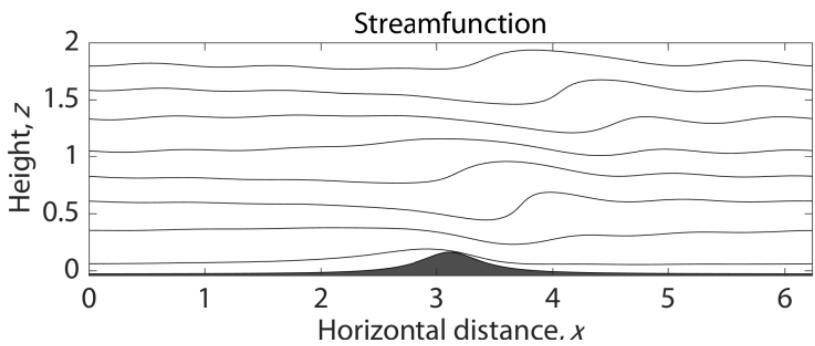
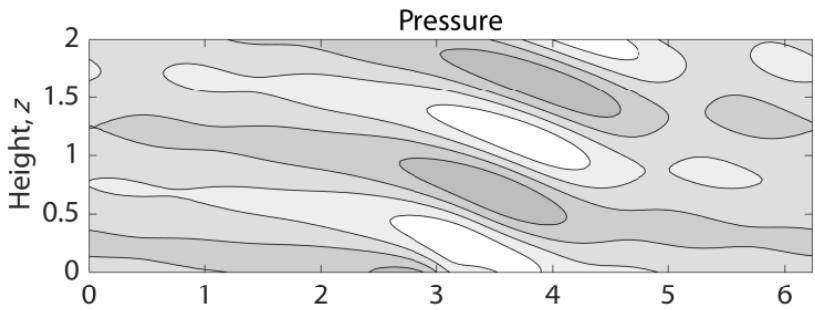


Fig. 7.17

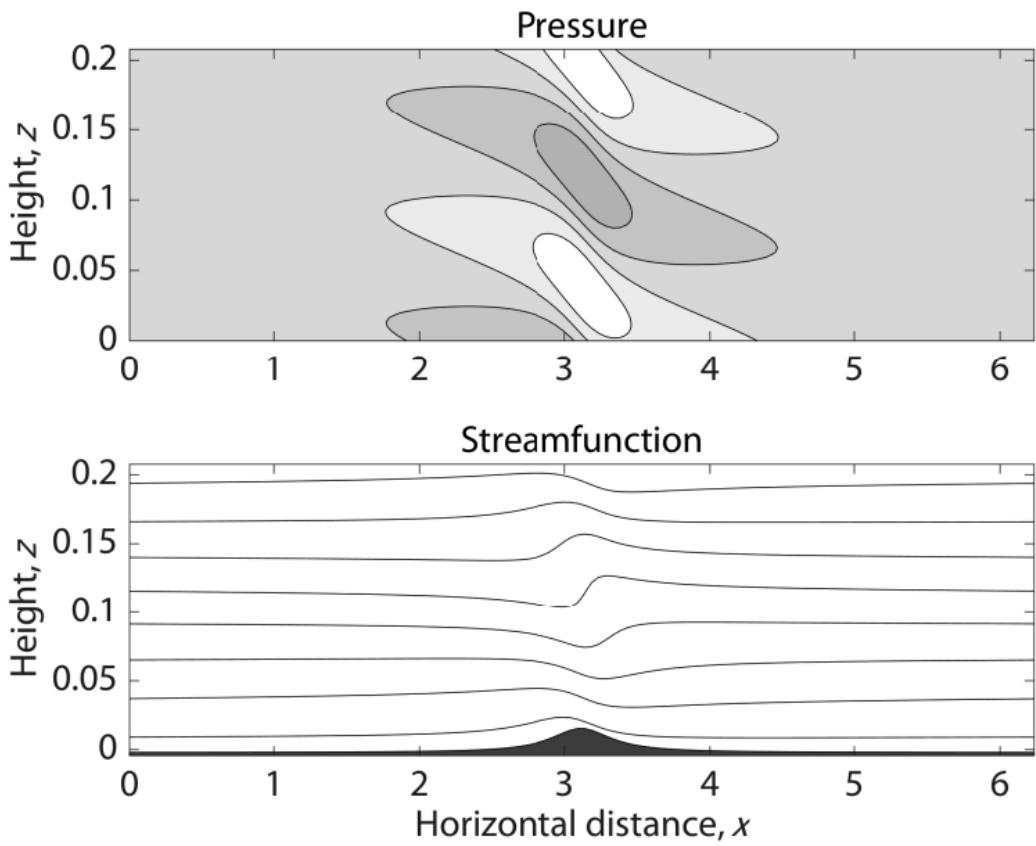


Fig. 7.18

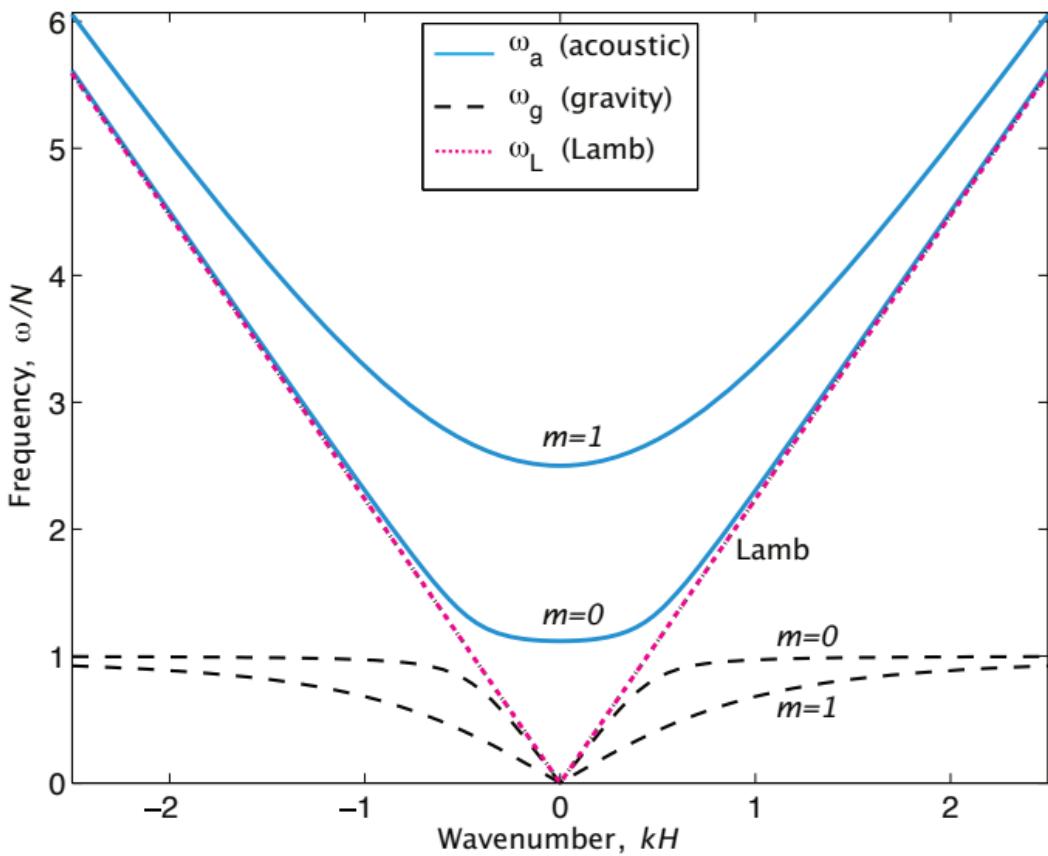
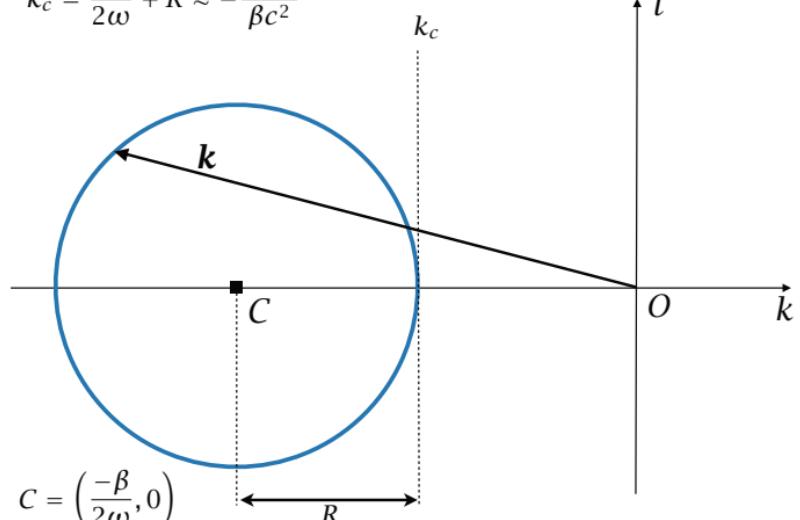


Fig. 7.19

Rossby waves

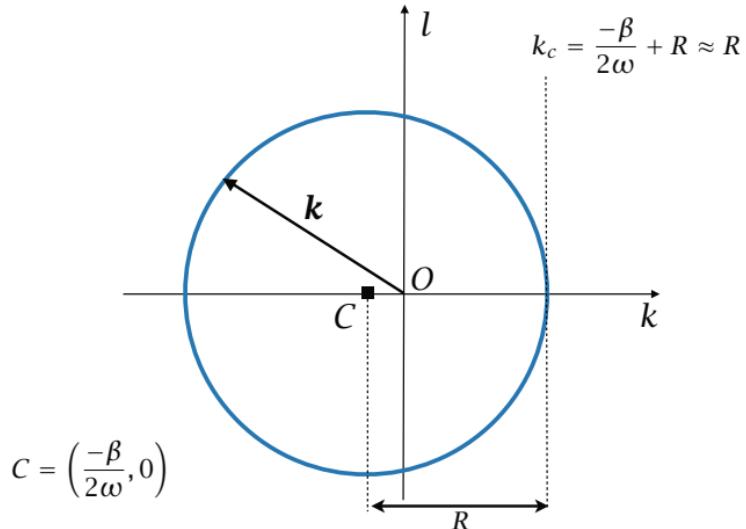
$$k_c = \frac{-\beta}{2\omega} + R \approx -\frac{\omega f_0^2}{\beta c^2}$$



$$C = \left(\frac{-\beta}{2\omega}, 0 \right)$$

$$R = \left[\left(\frac{\beta}{2\omega} \right)^2 + \frac{\omega^2 - f_0^2}{c^2} \right]^{1/2} \approx \left[\left(\frac{\beta}{2\omega} \right)^2 - \frac{f_0^2}{c^2} \right]^{1/2}$$

Gravity waves



$$C = \left(\frac{-\beta}{2\omega}, 0 \right)$$

$$R = \left[\left(\frac{\beta}{2\omega} \right)^2 + \frac{\omega^2 - f_0^2}{c^2} \right]^{1/2} \approx \left[\frac{\omega^2 - f_0^2}{c^2} \right]^{1/2}$$

Fig. 8.1

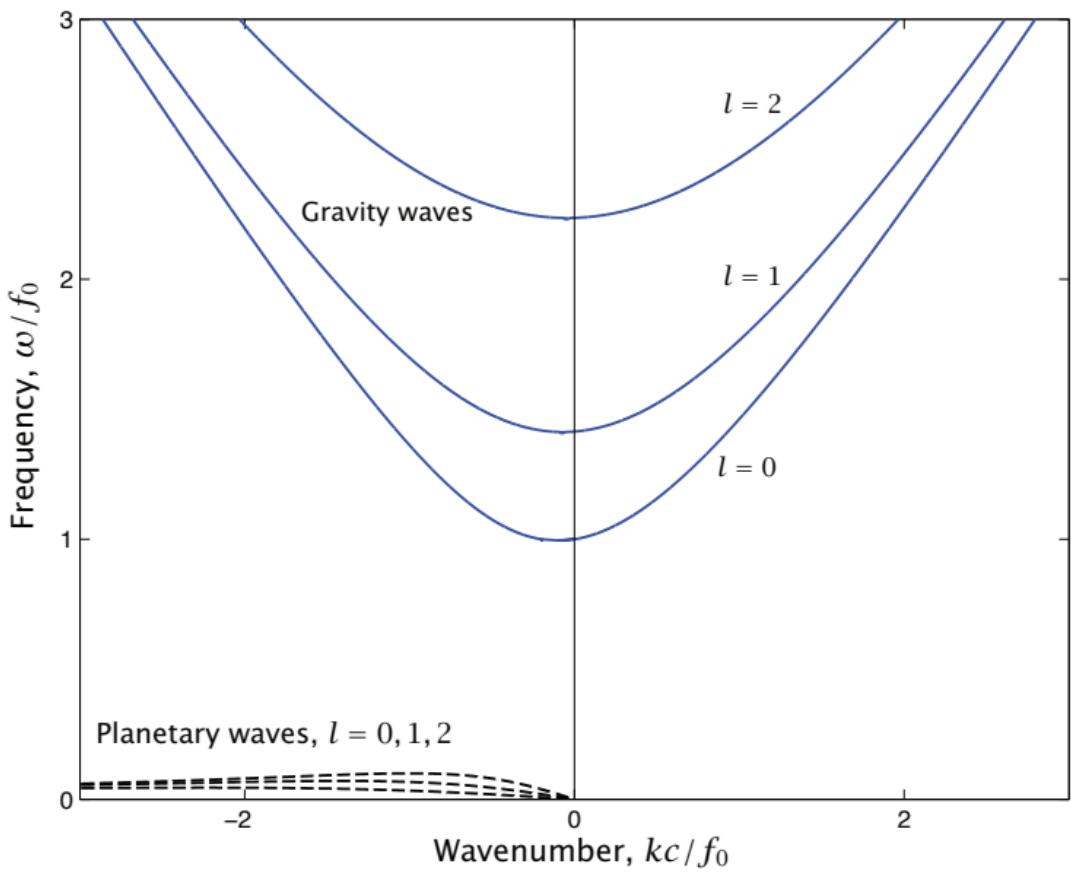


Fig. 8.2

Locus of wavenumbers of
given frequency ω

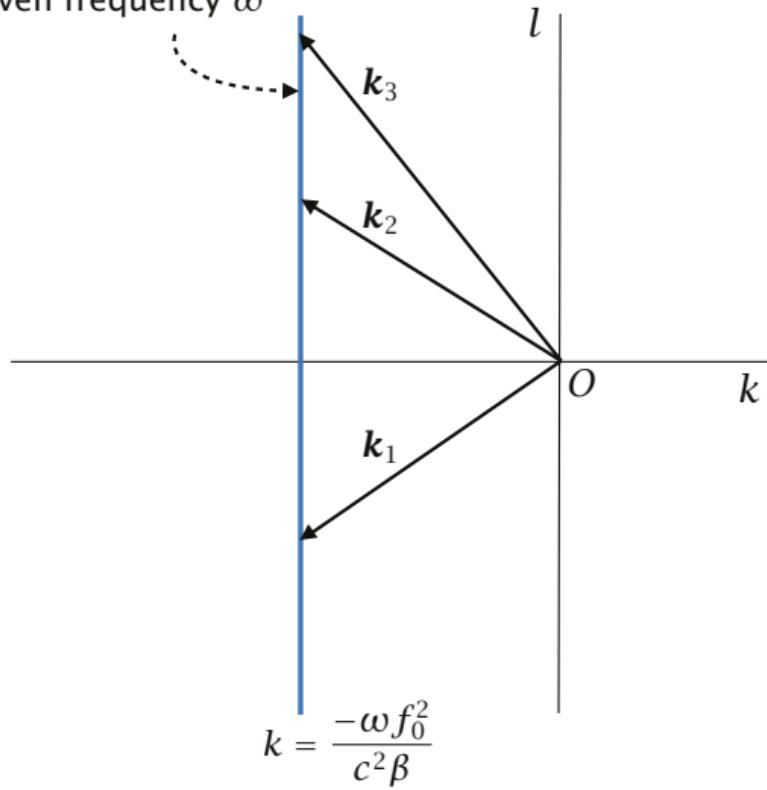


Fig. 8.3

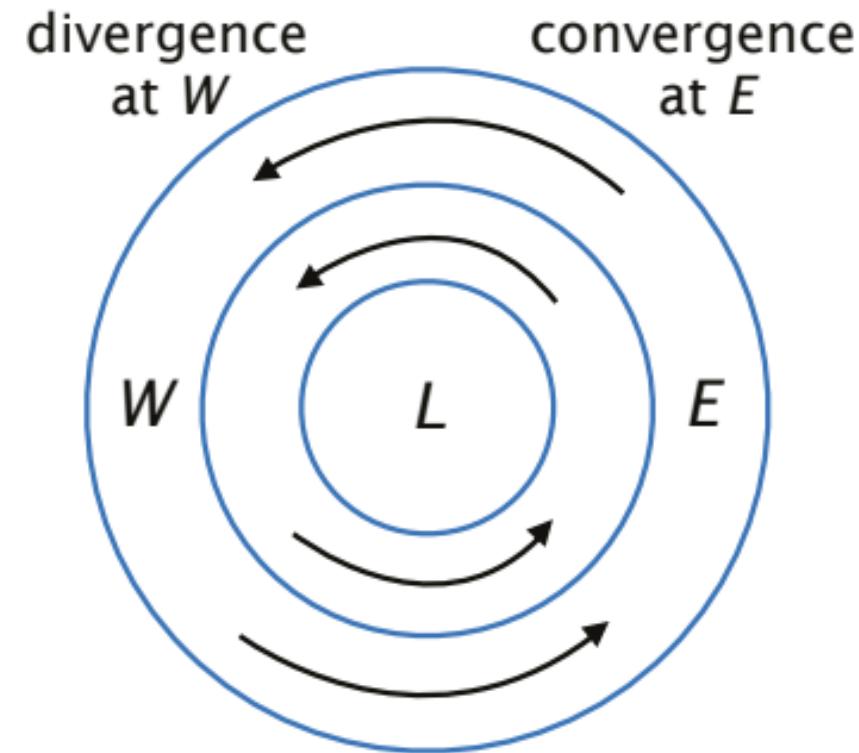
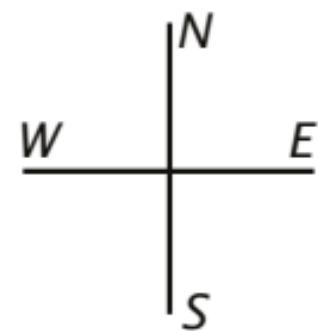
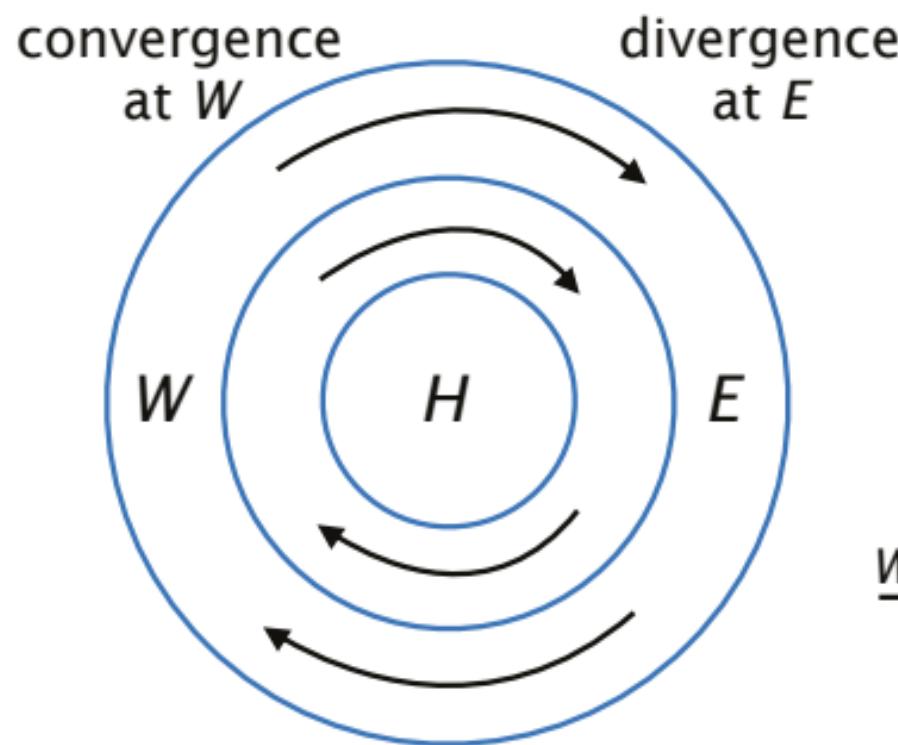


Fig. 8.4

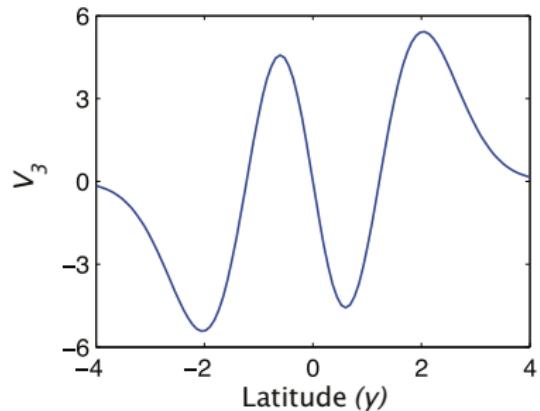
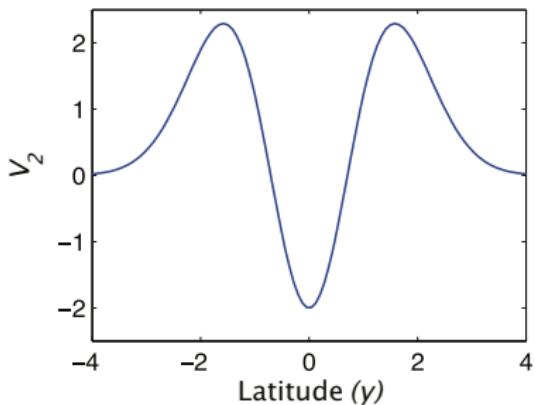
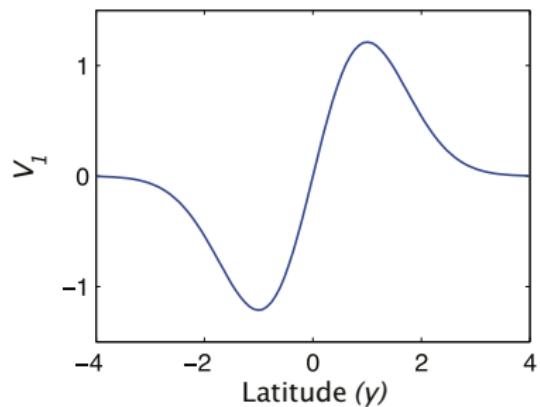
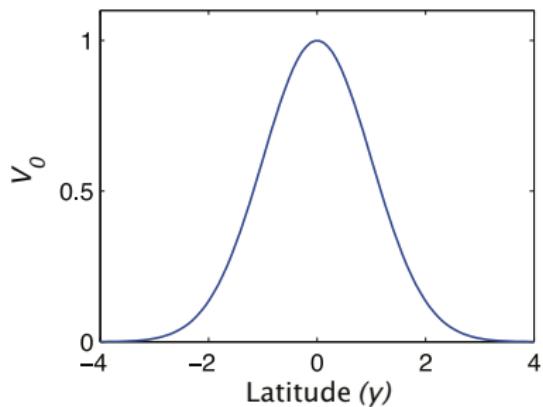


Fig. 8.5

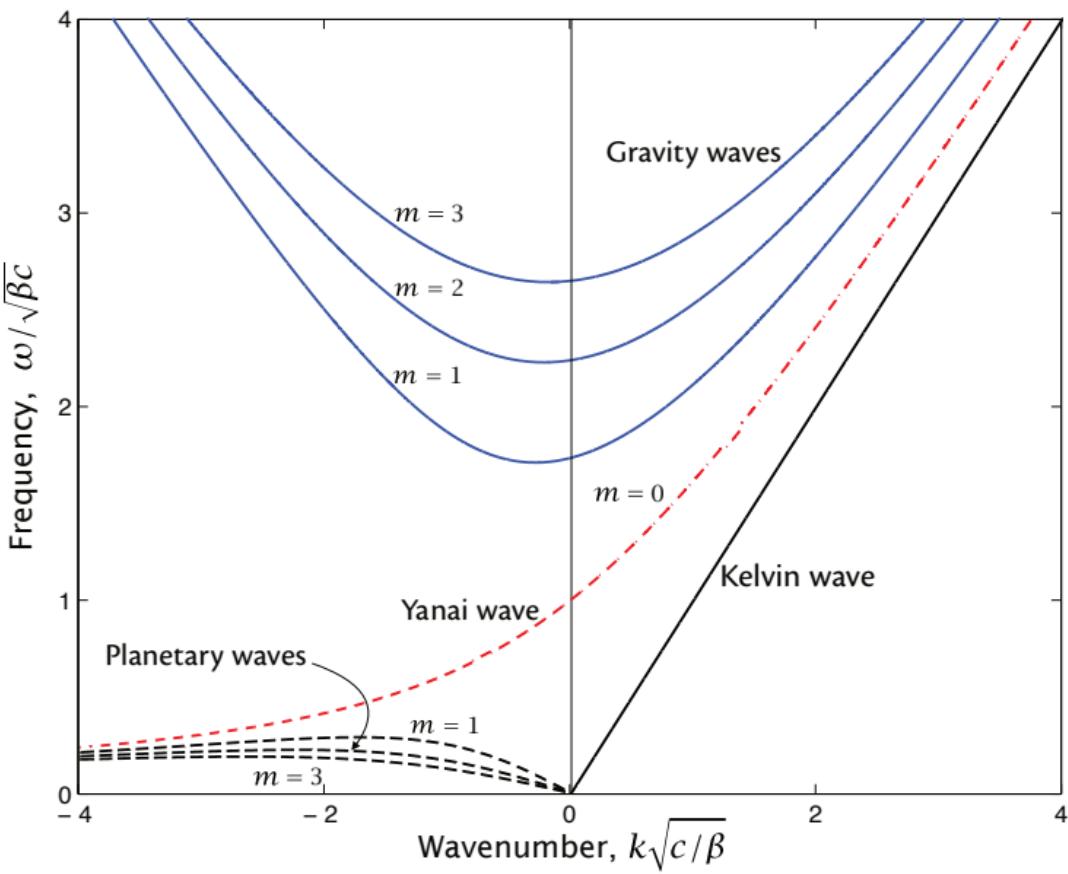


Fig. 8.6

Frequency, $\omega / \sqrt{\beta c}$

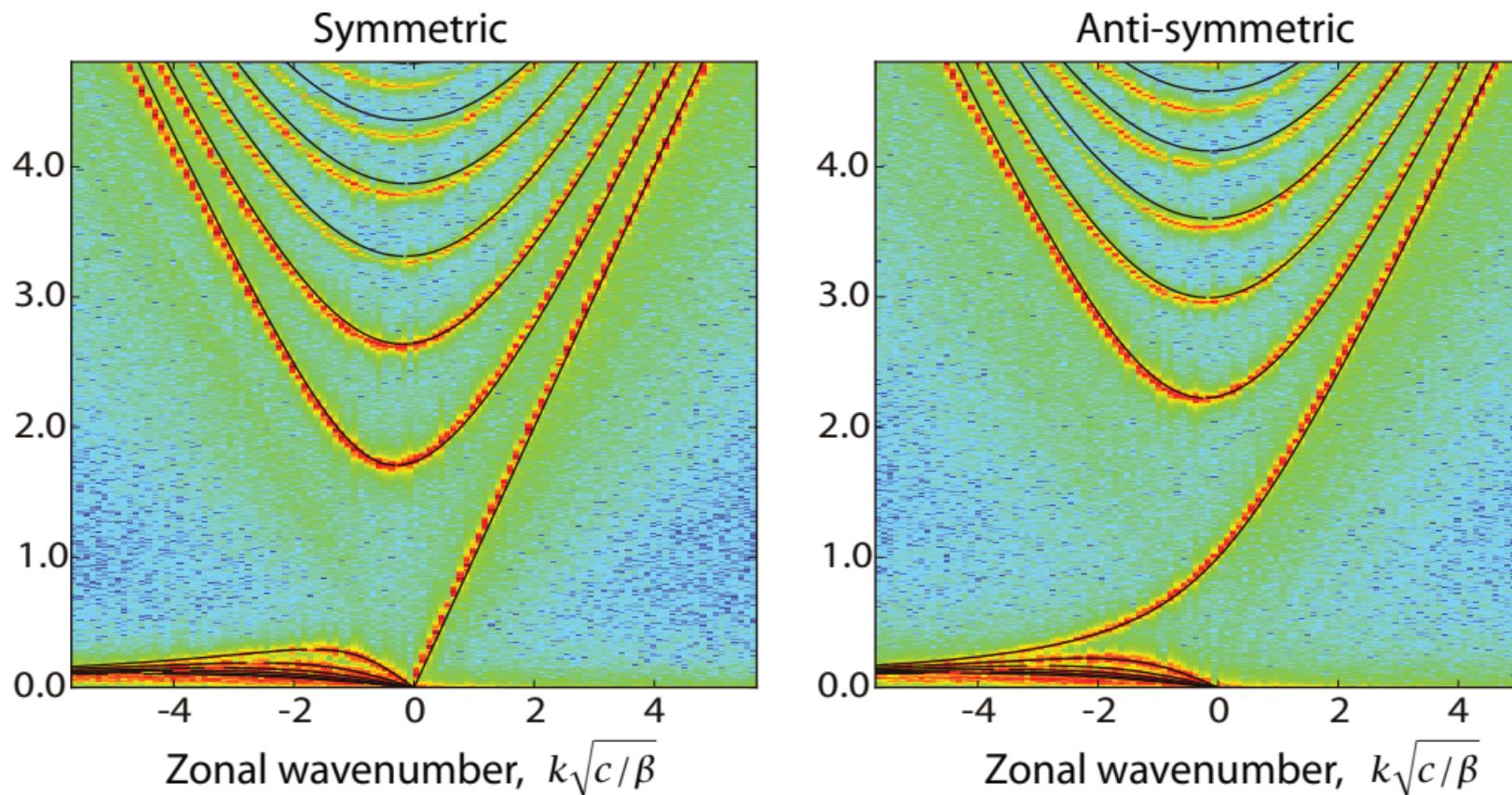


Fig. 8.7

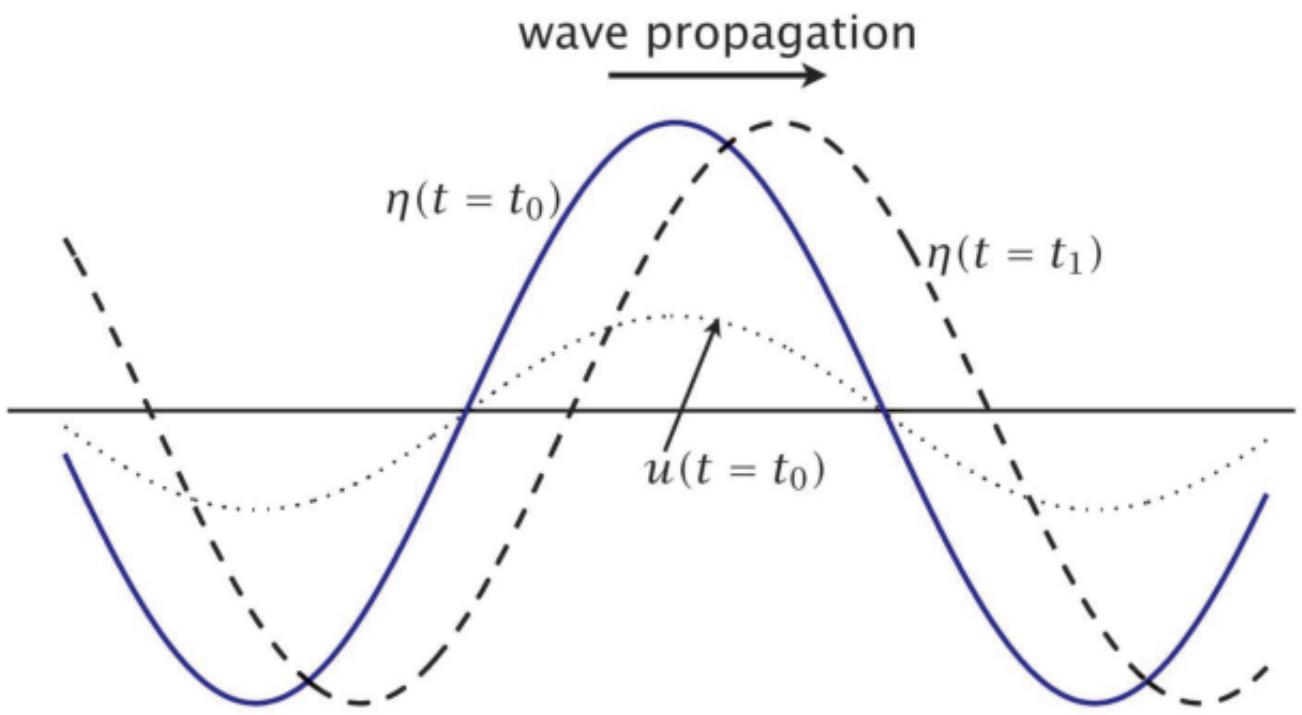


Fig. 8.8

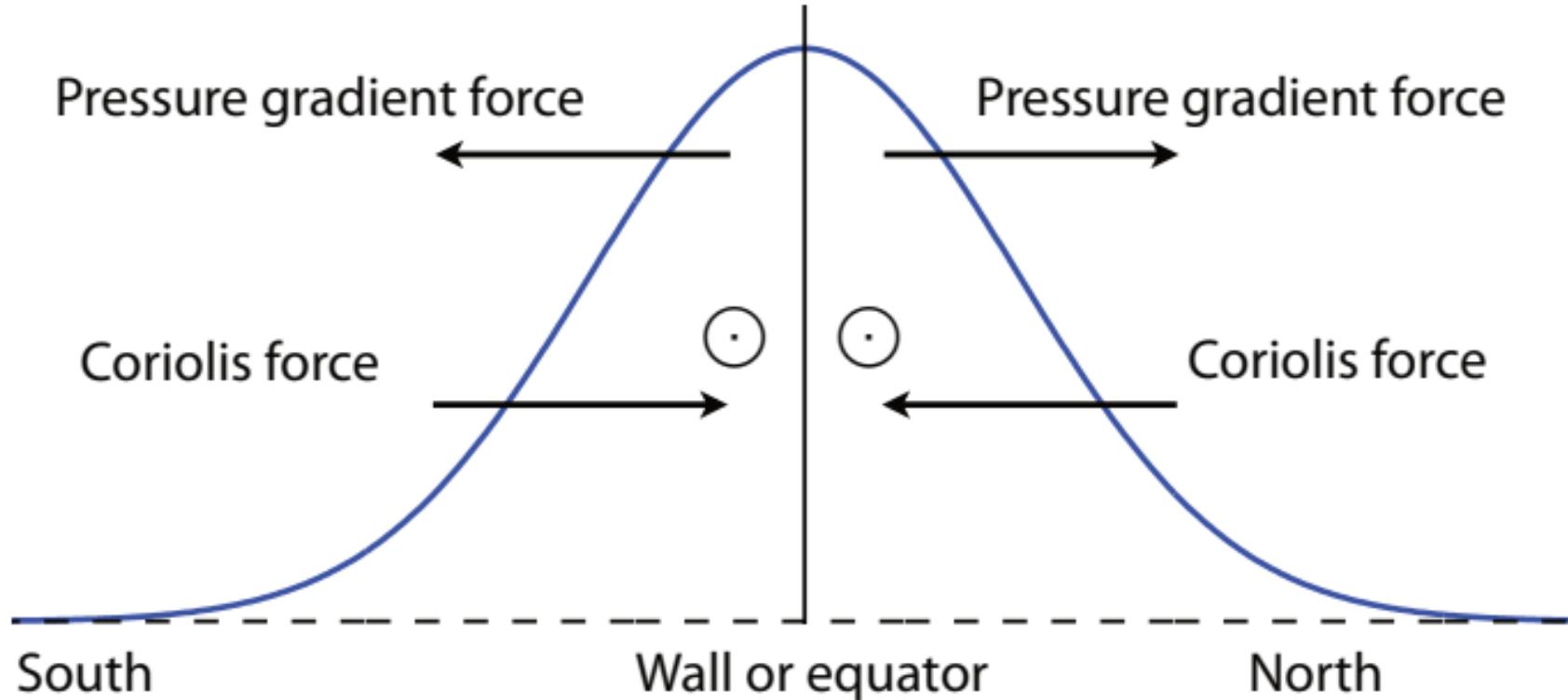


Fig. 8.9

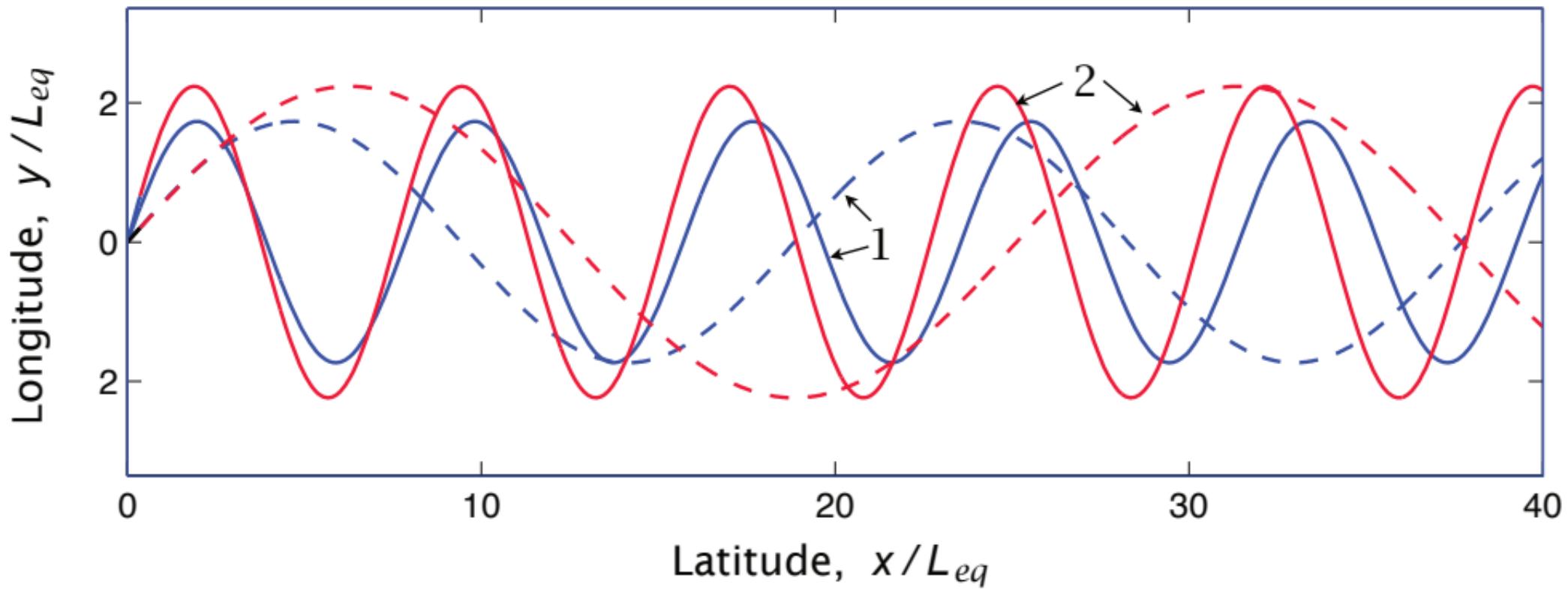


Fig. 8.10

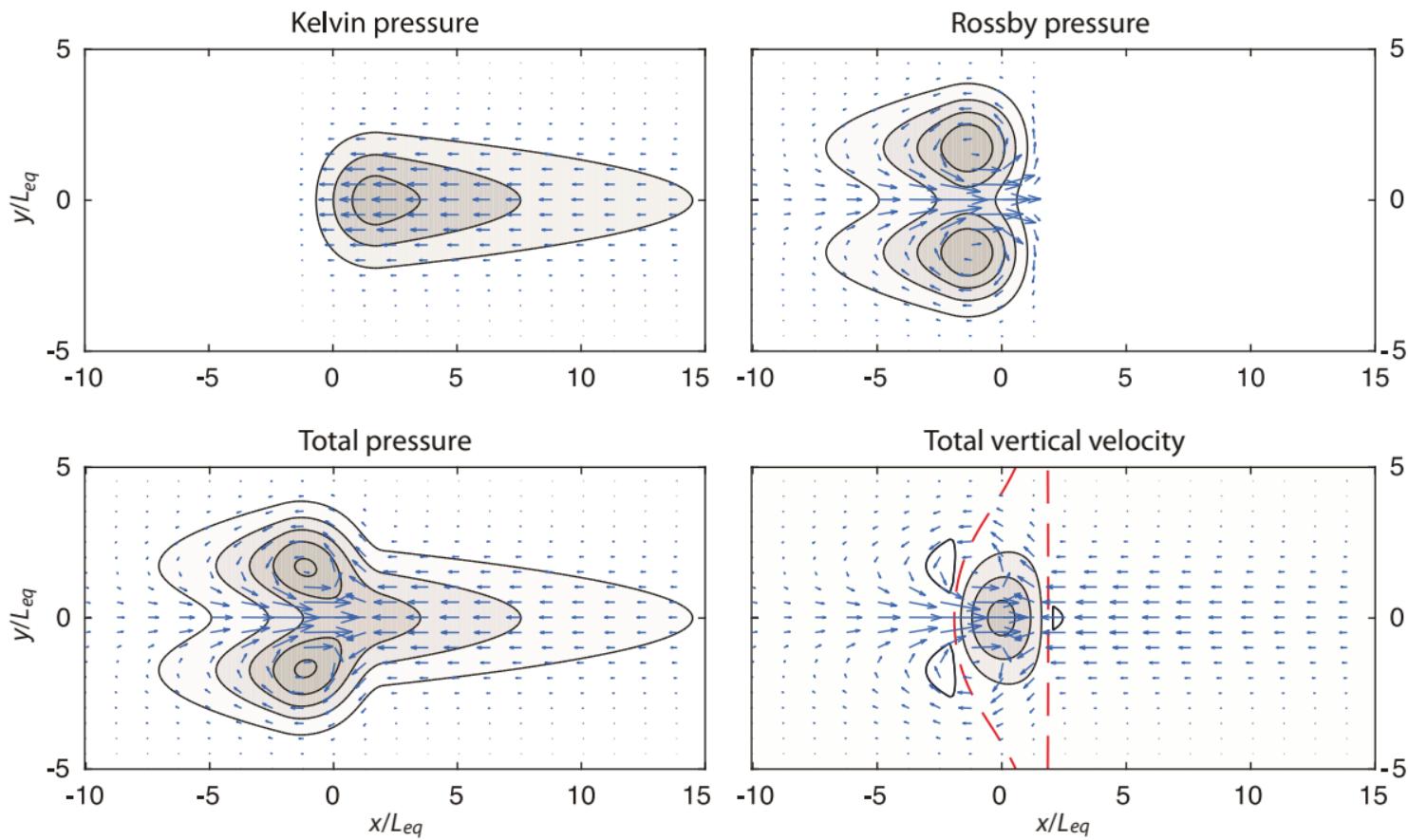


Fig. 8.11

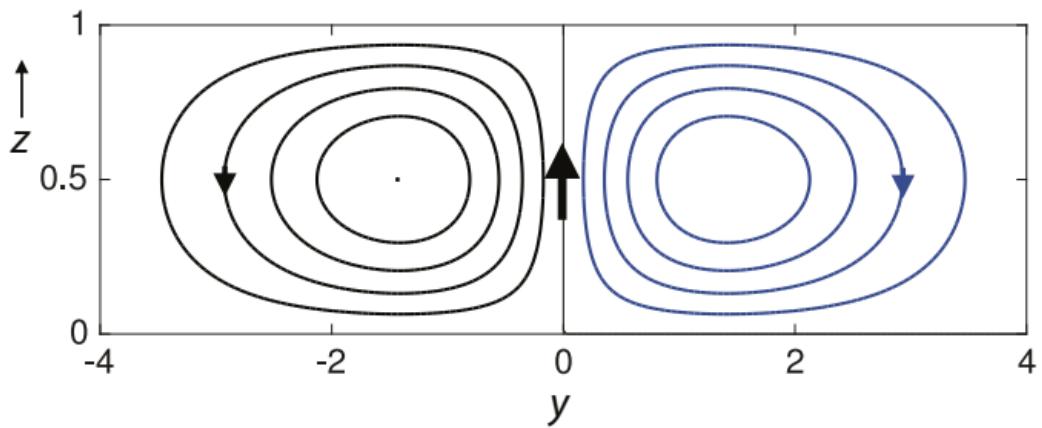
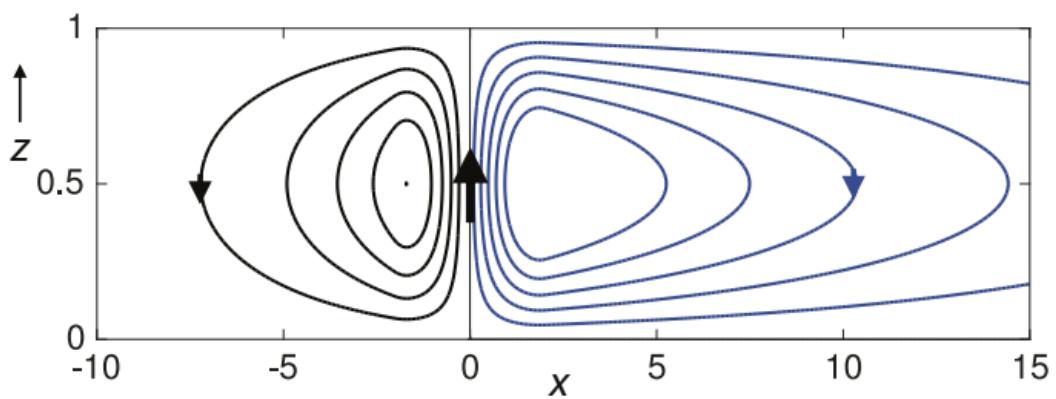


Fig. 8.12

Pressure and Velocity

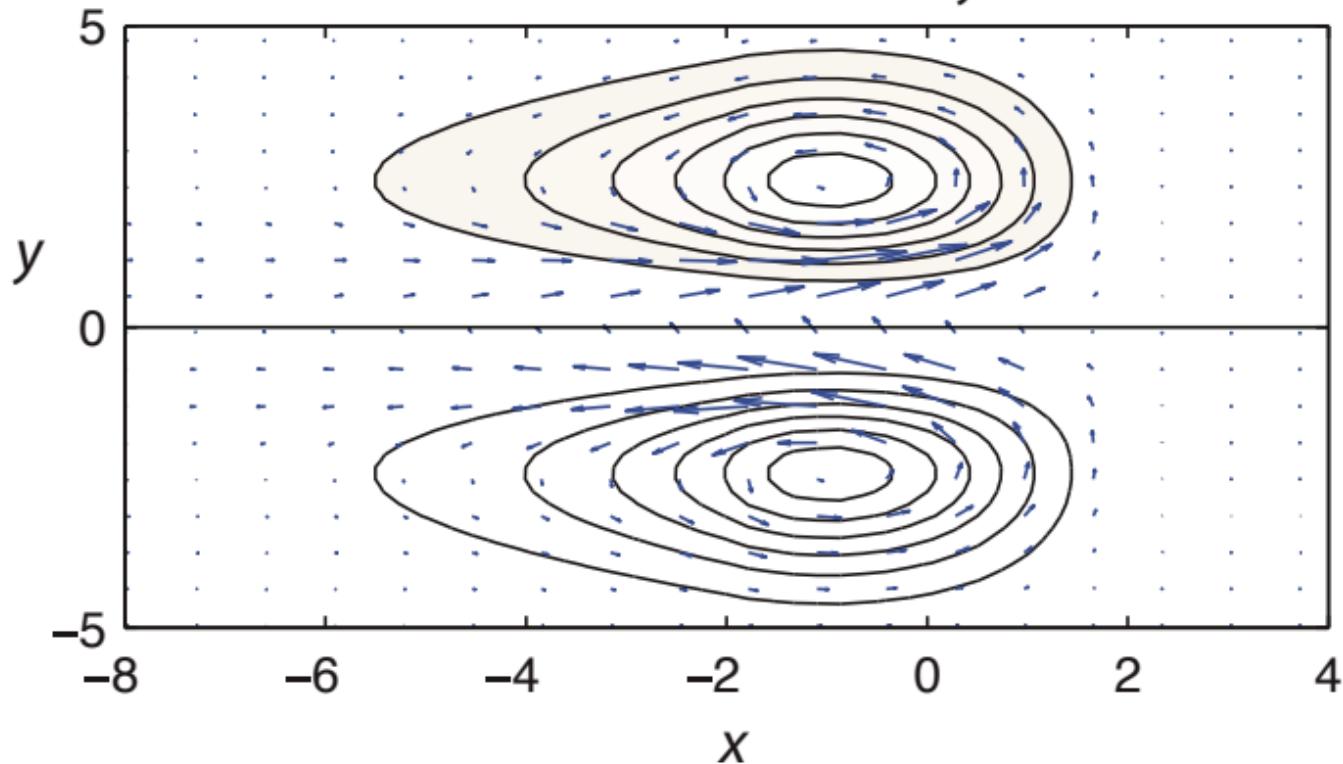
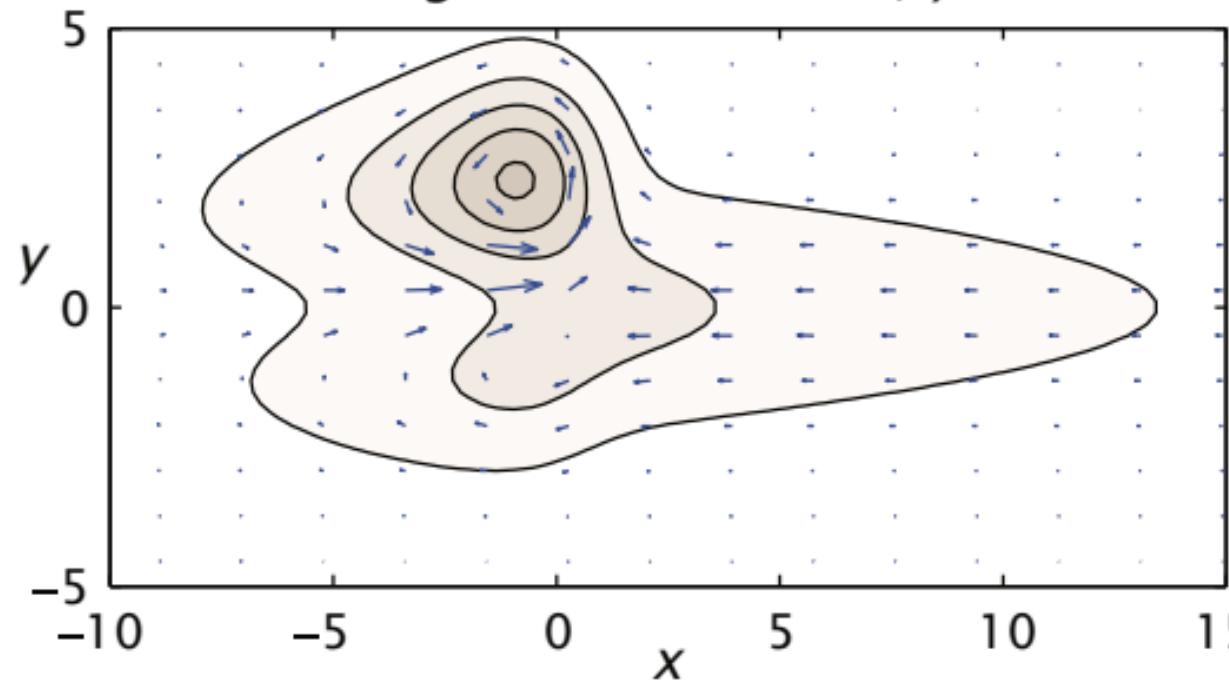


Fig. 8.13

Heating centred at $x = 0$, $y = 1$



Heating centred at $x = 0$, $y = 2$

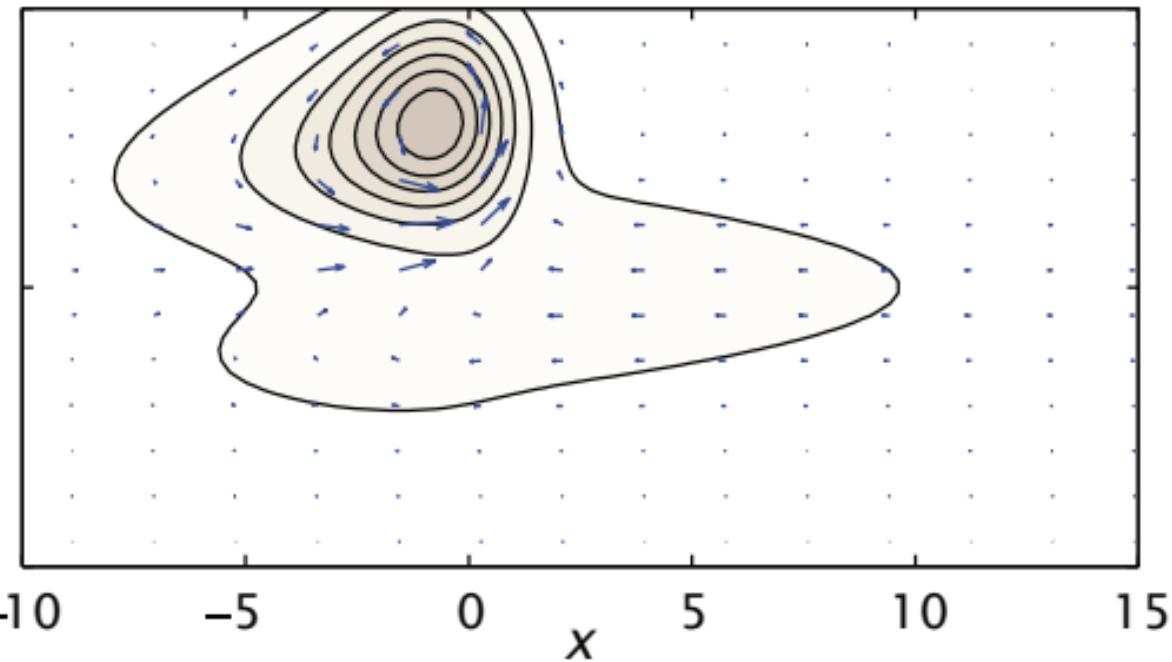
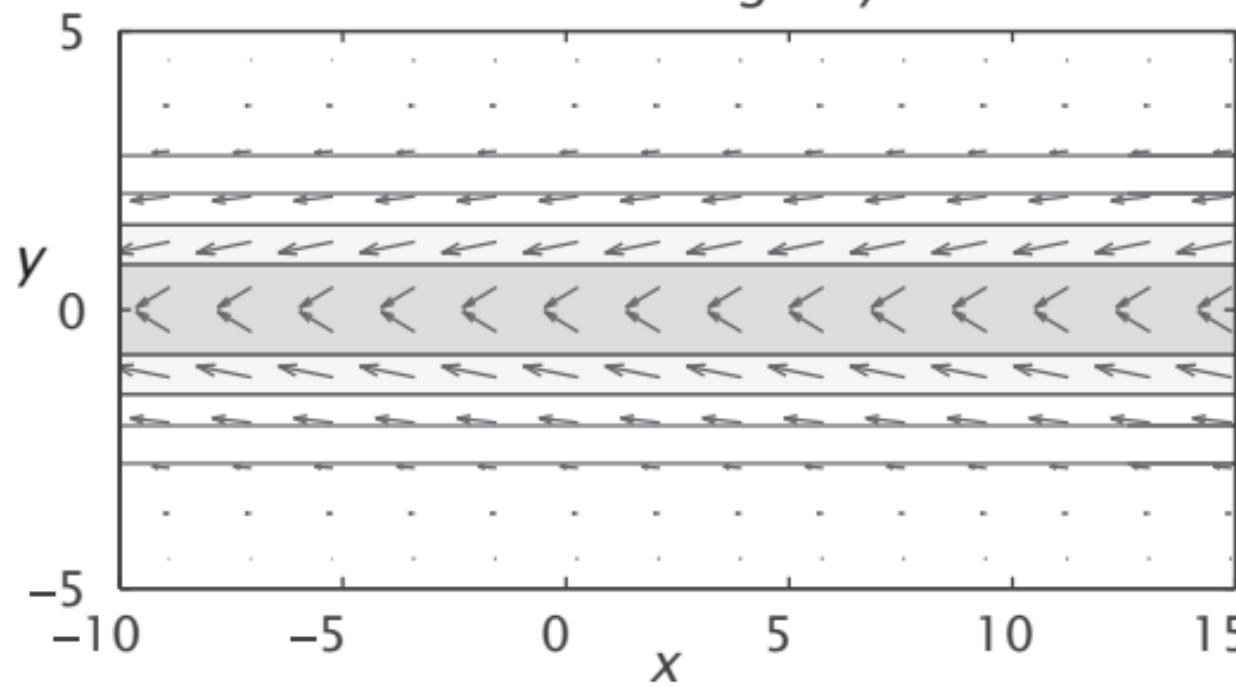


Fig. 8.14

Line of heating at $y = 0$



Line of heating at $y = 1$

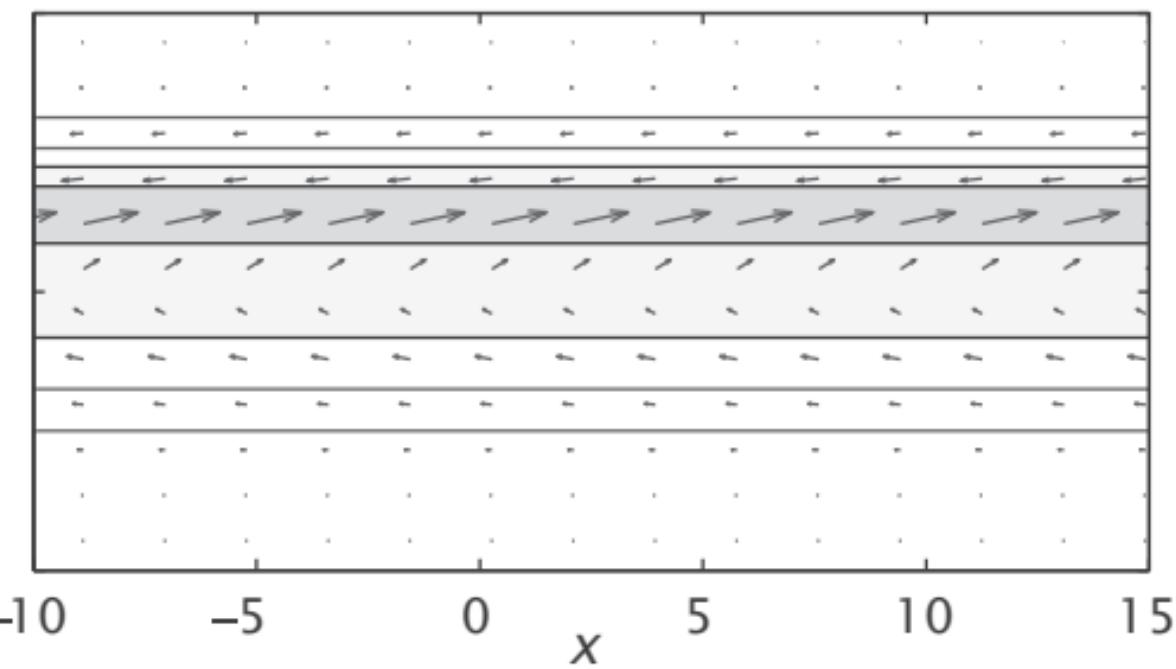
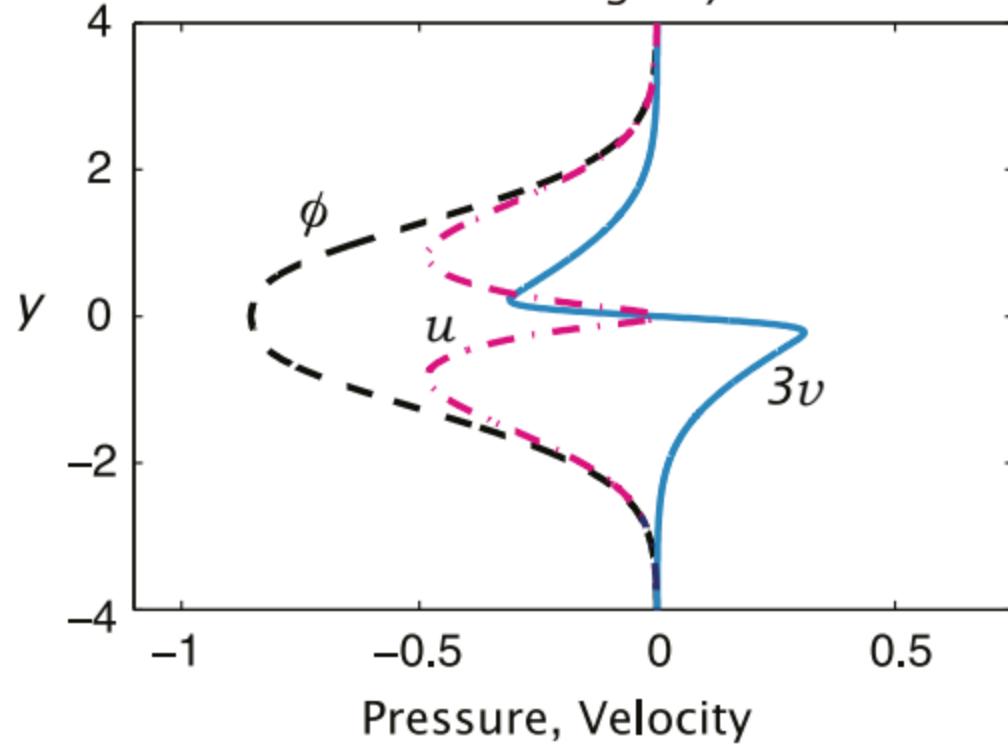


Fig. 8.15

Line of heating at $y = 0$



Line of heating at $y = 1$

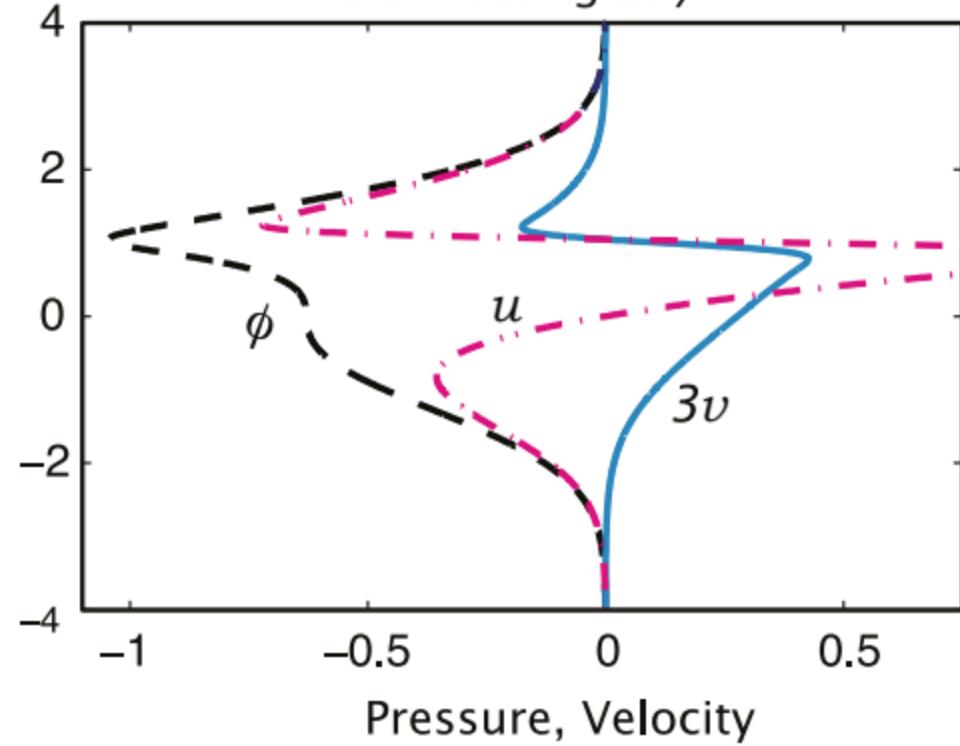


Fig. 8.16

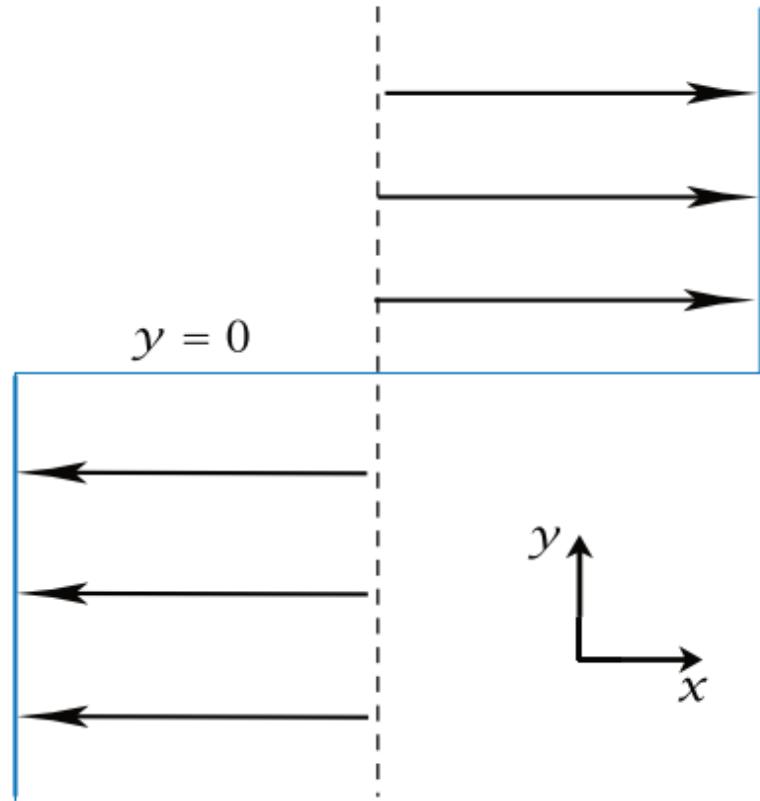


Fig. 9.1

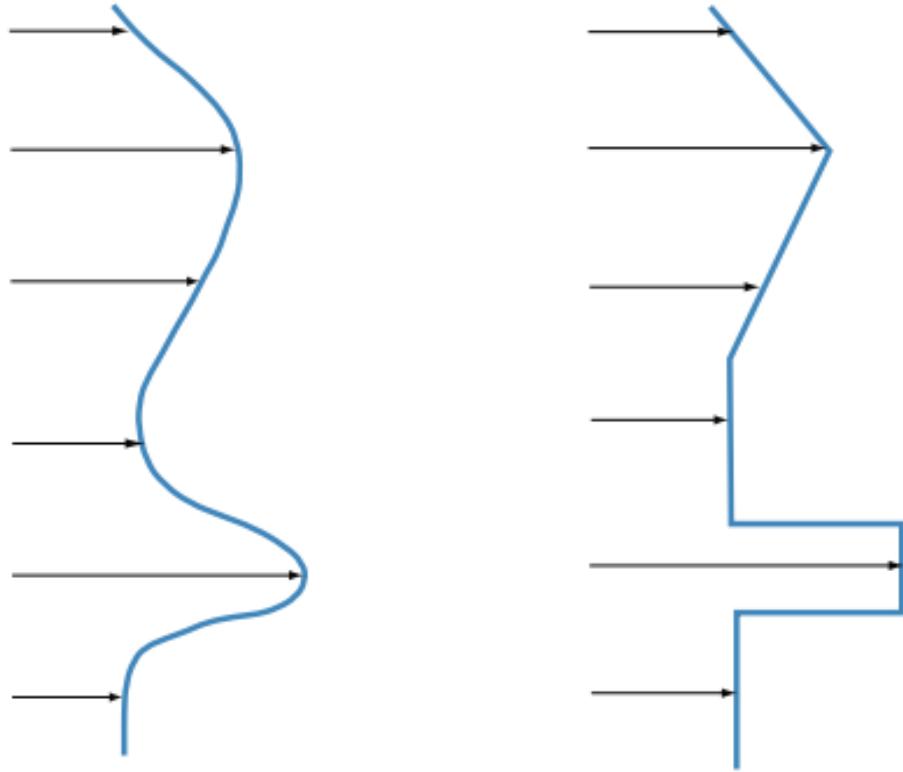


Fig. 9.2

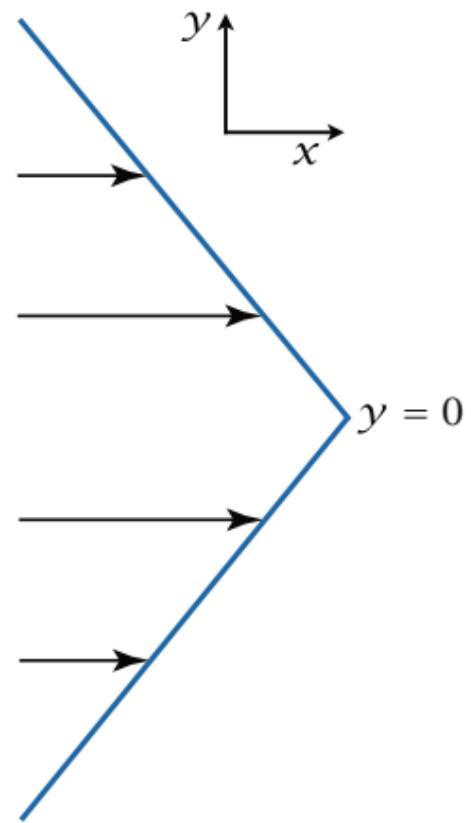


Fig. 9.3

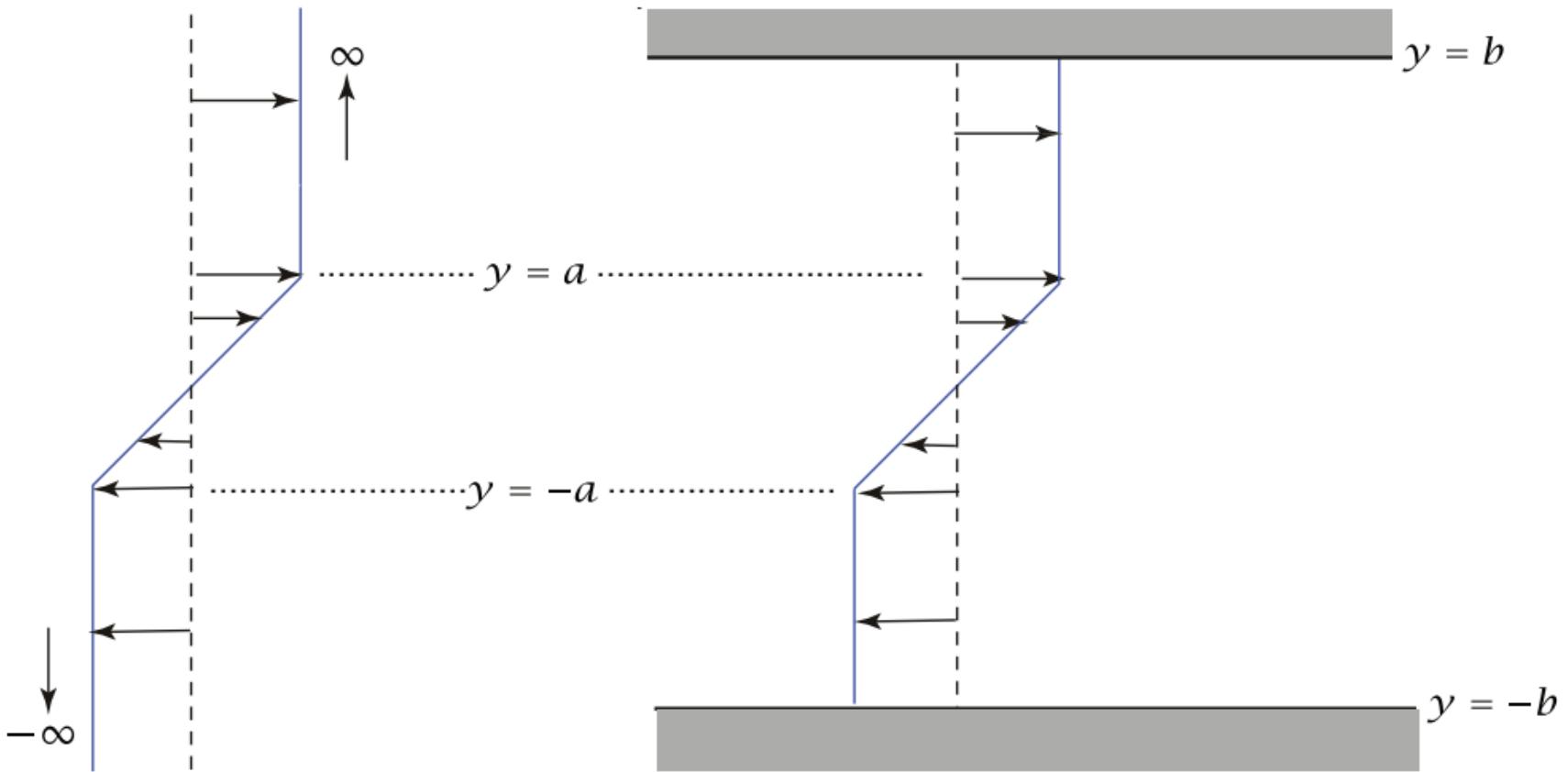


Fig. 9.4

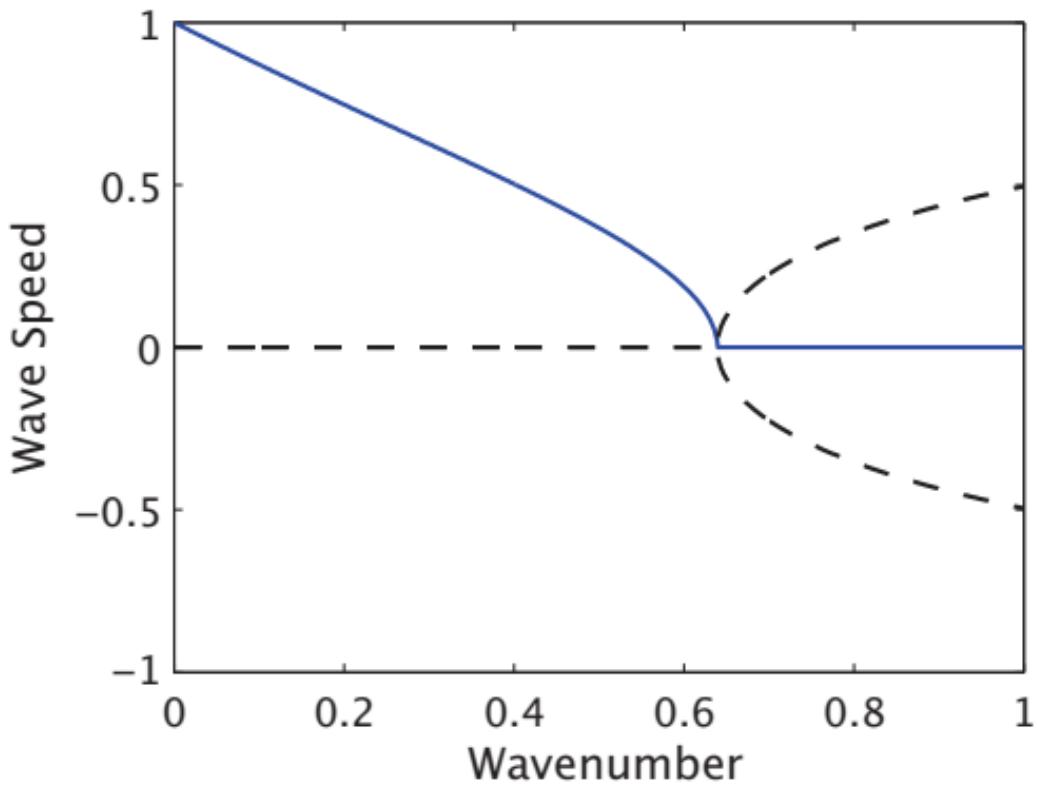
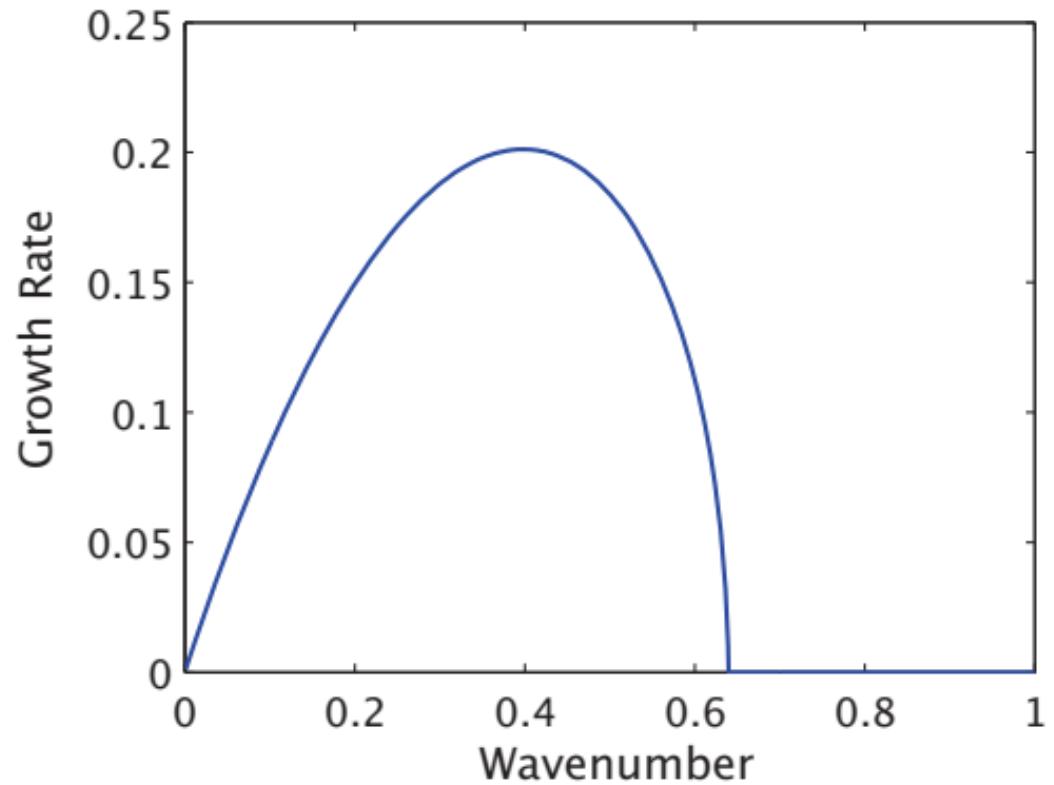


Fig. 9.5

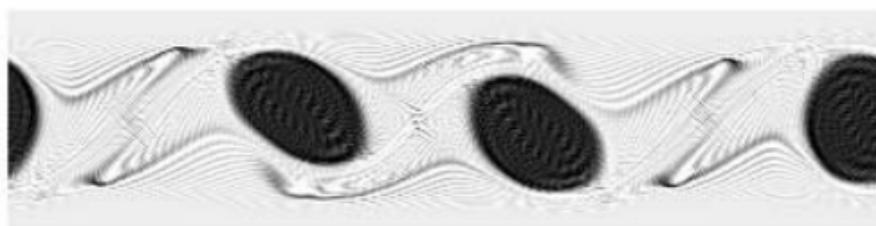
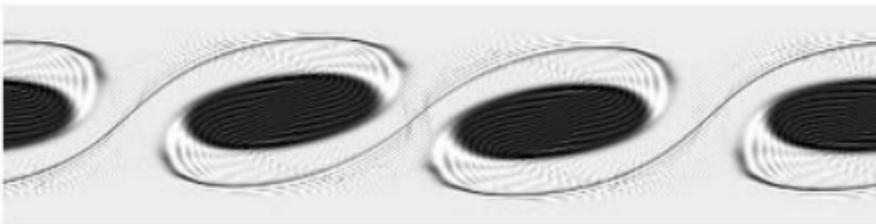


Fig. 9.6

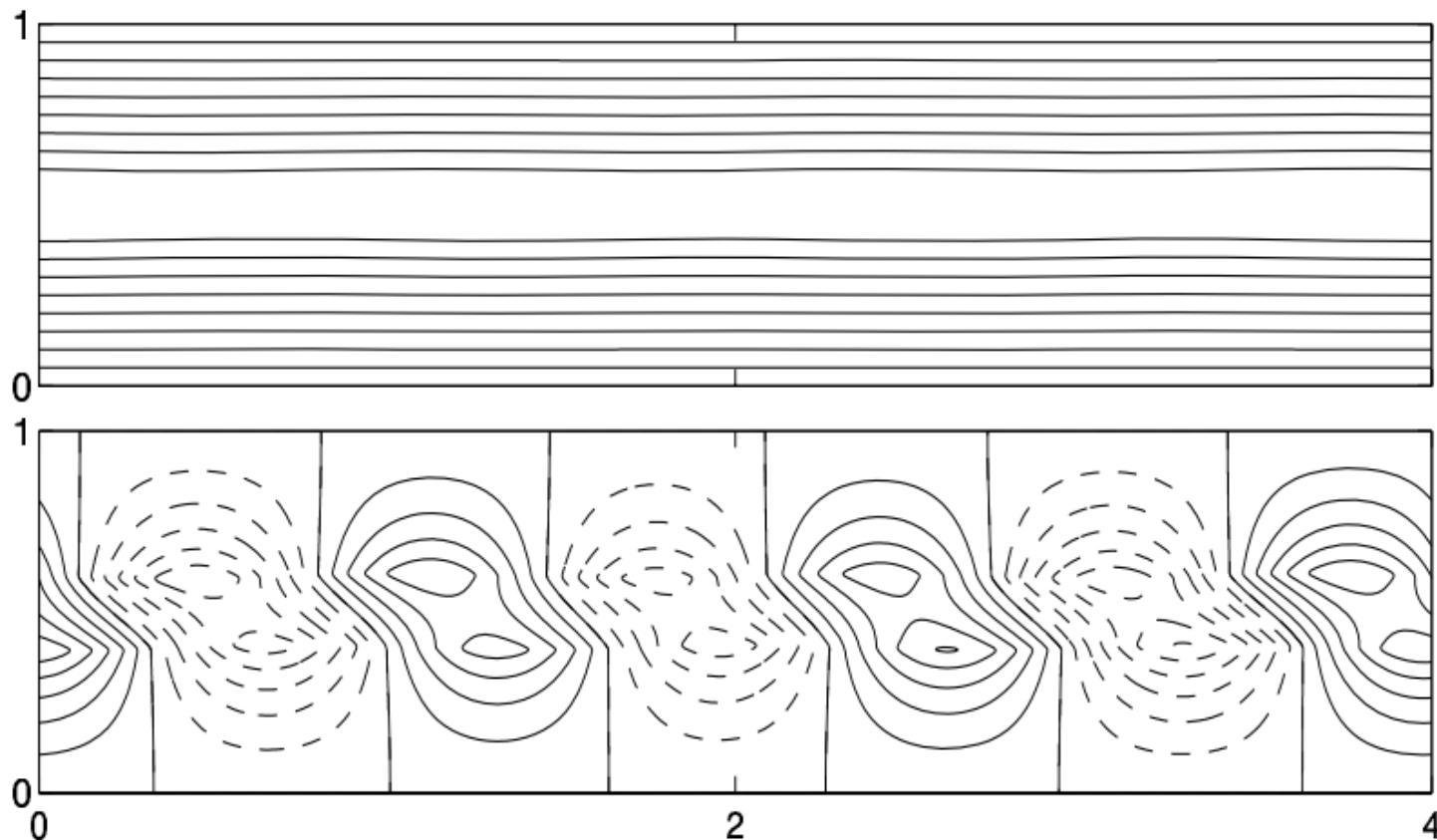


Fig. 9.7

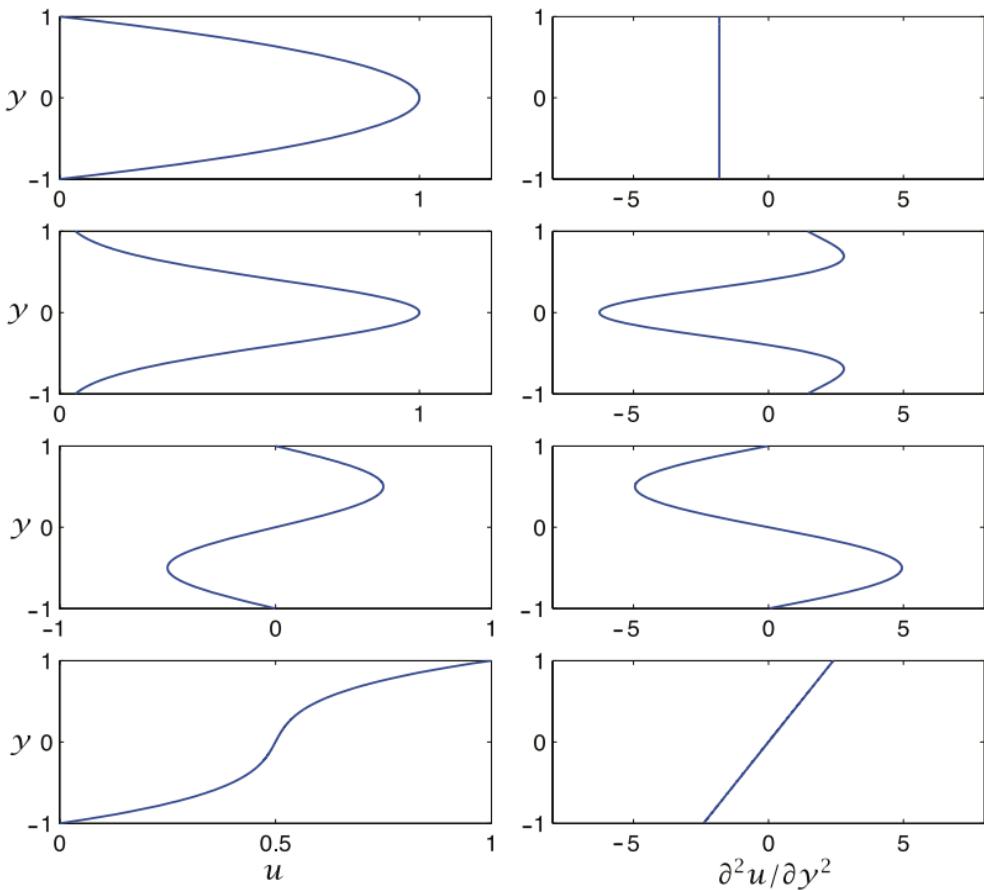


Fig. 9.8

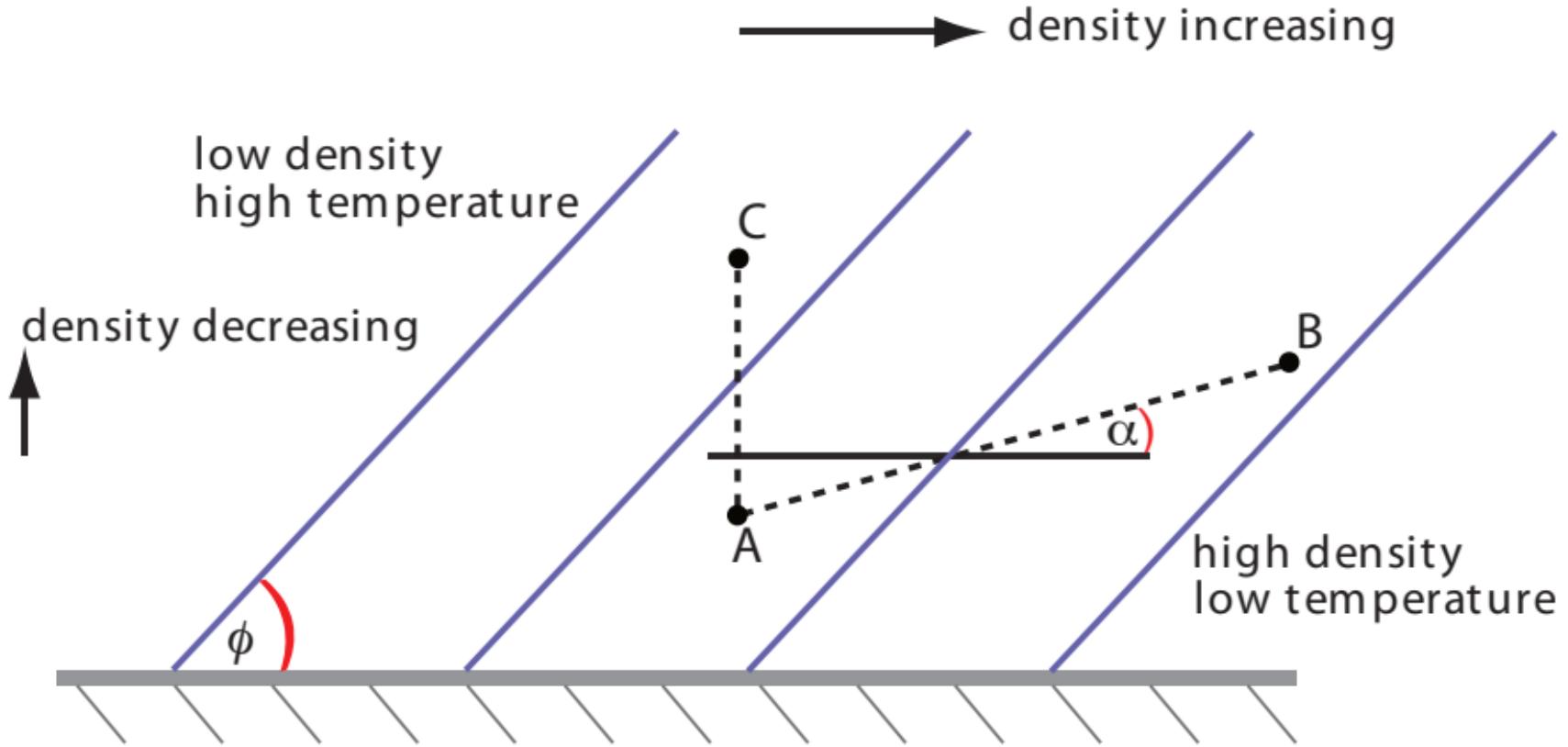


Fig. 9.9

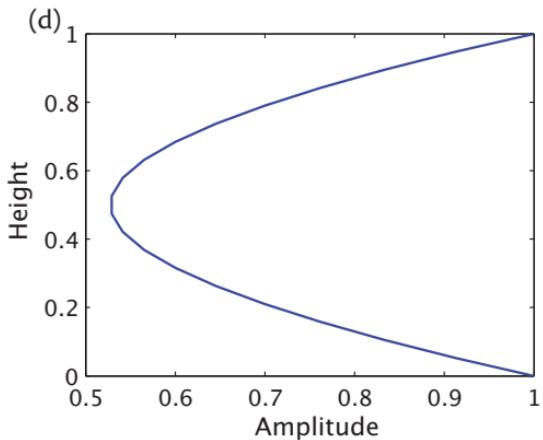
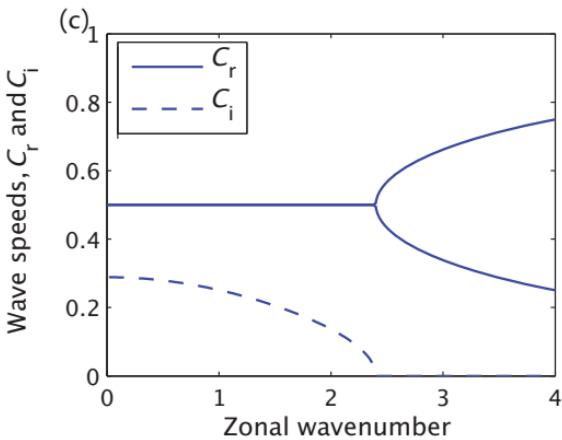
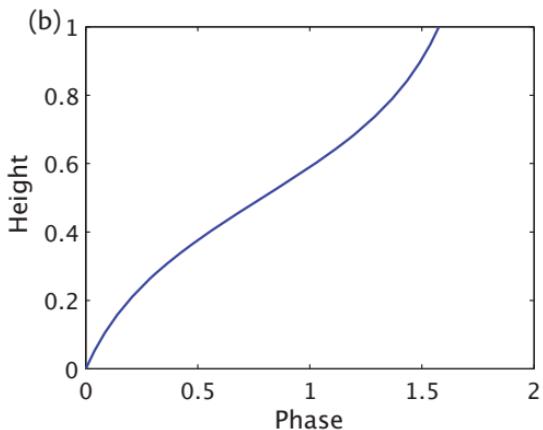
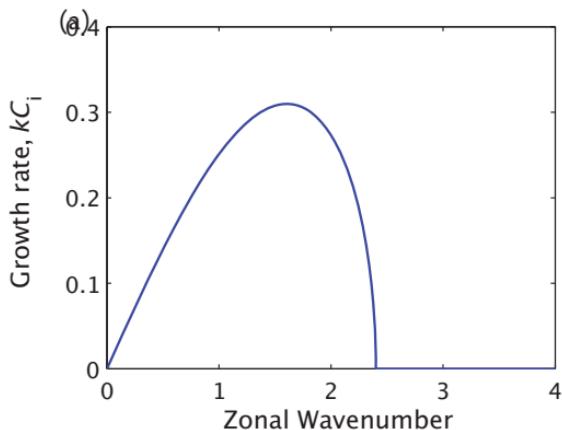


Fig. 9.10

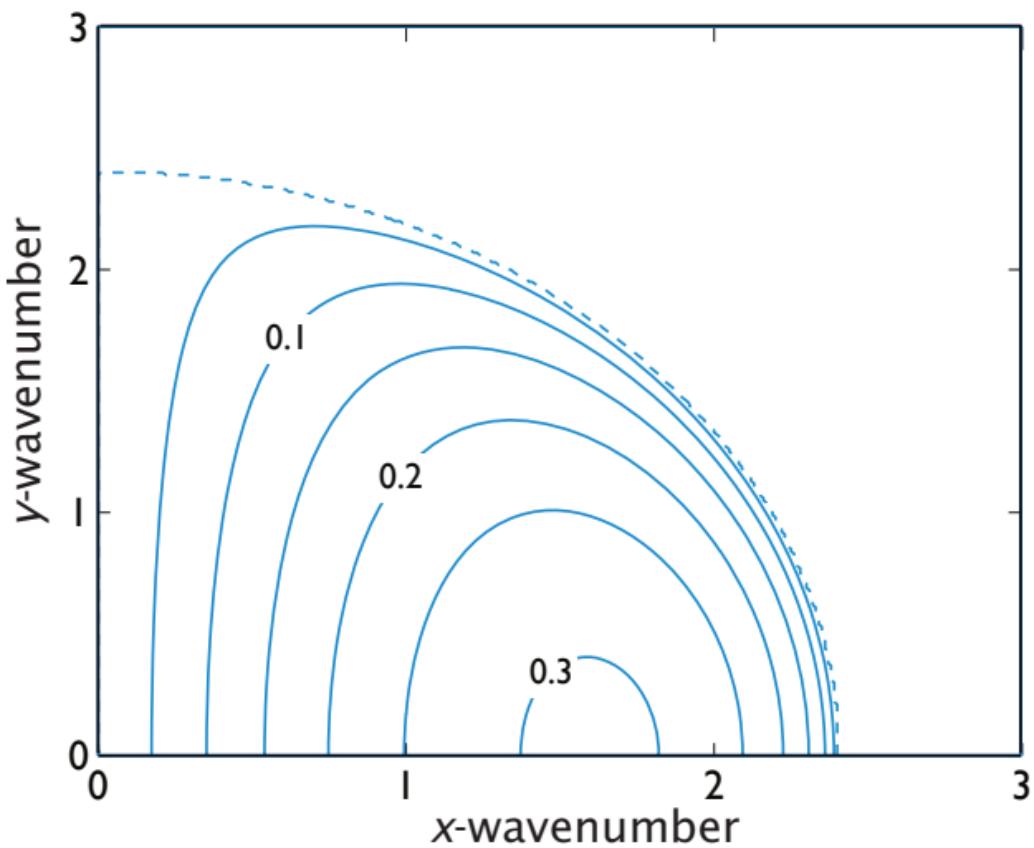


Fig. 9.11

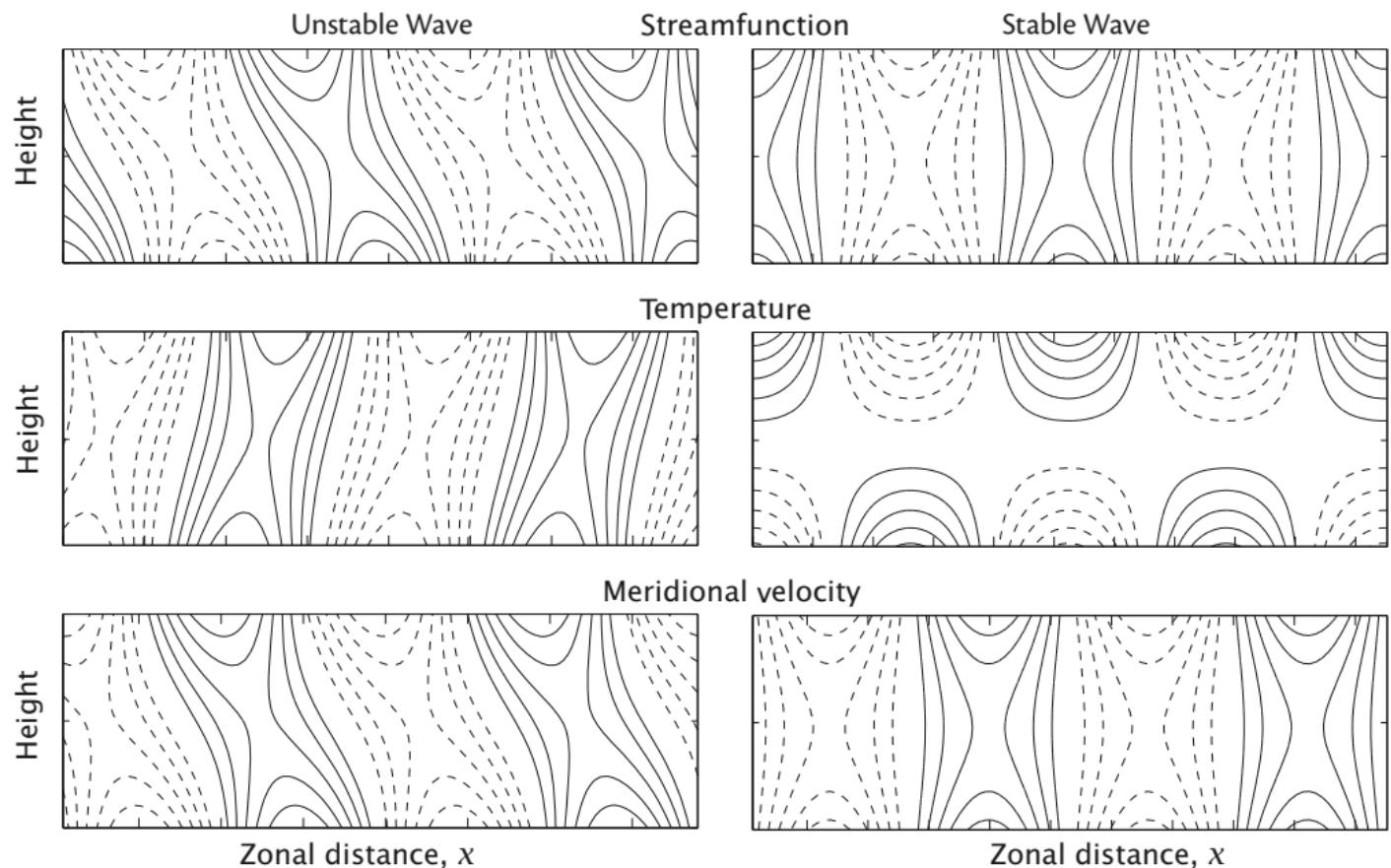


Fig. 9.12

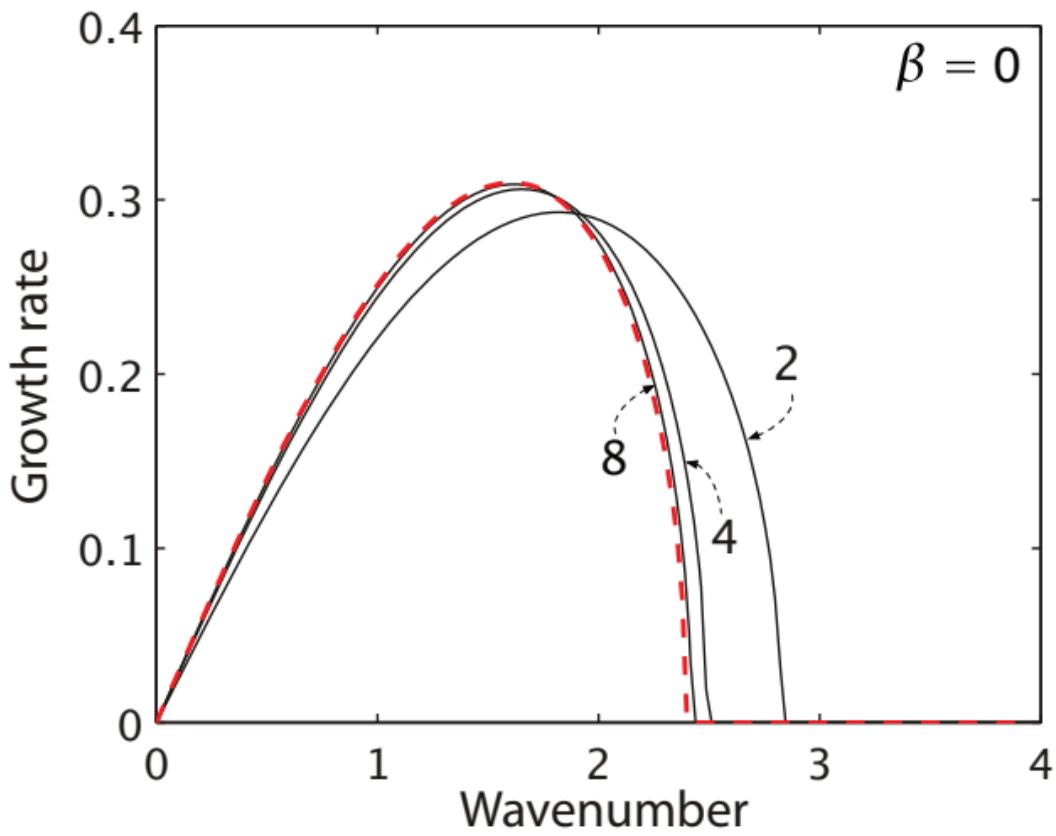


Fig. 9.13

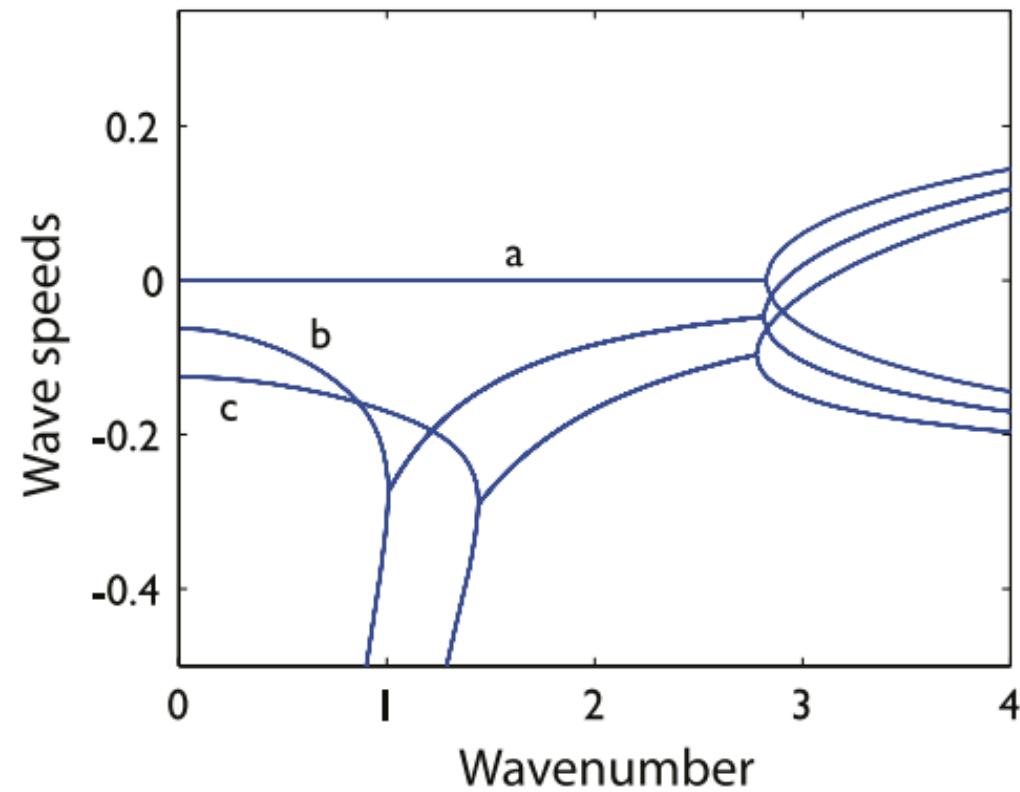
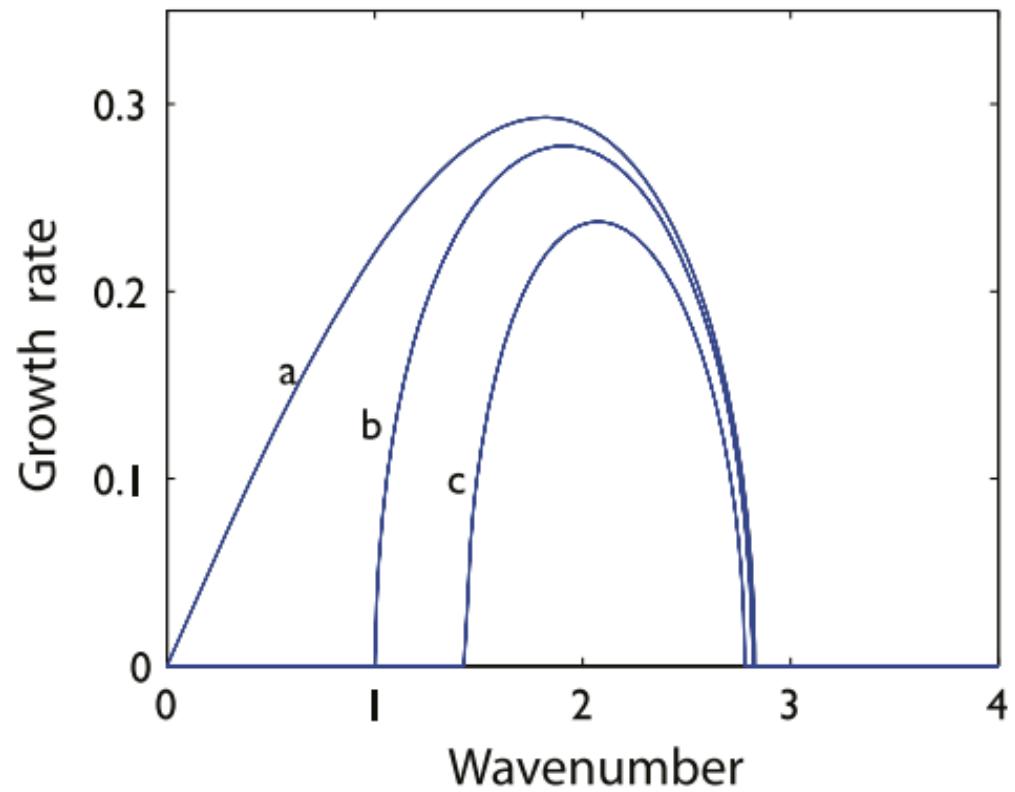


Fig. 9.14

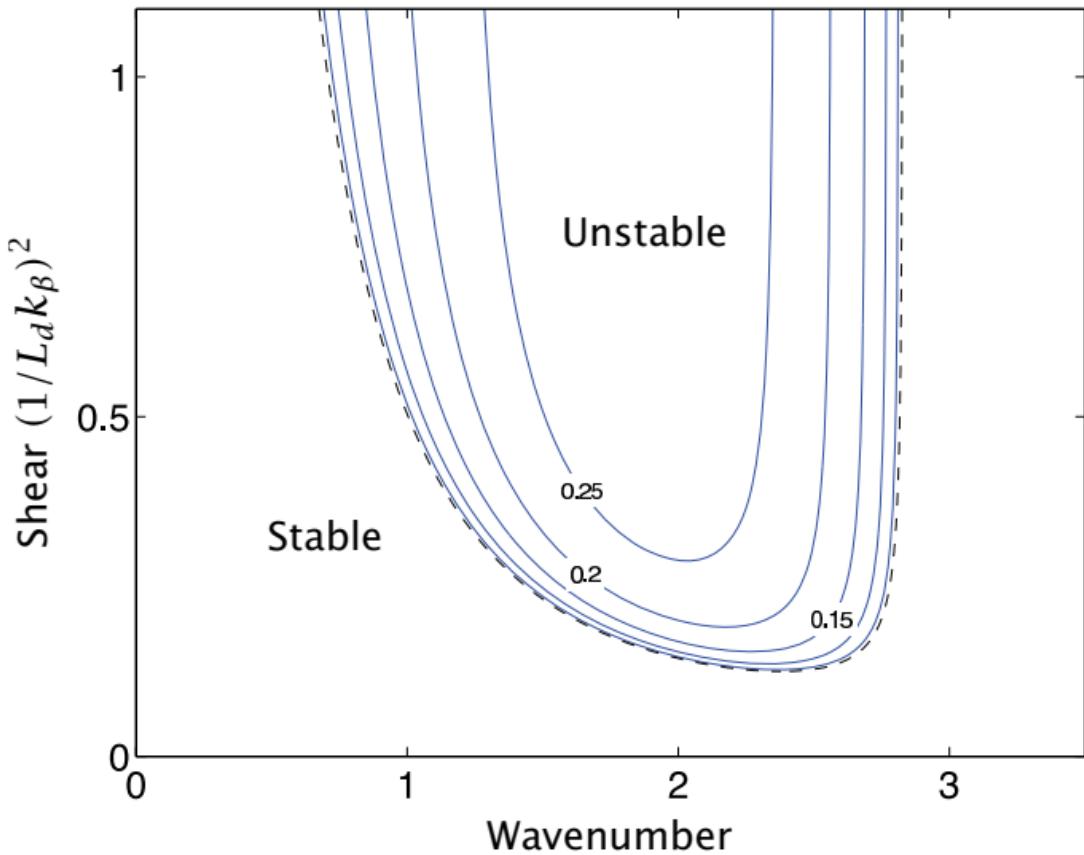


Fig. 9.15

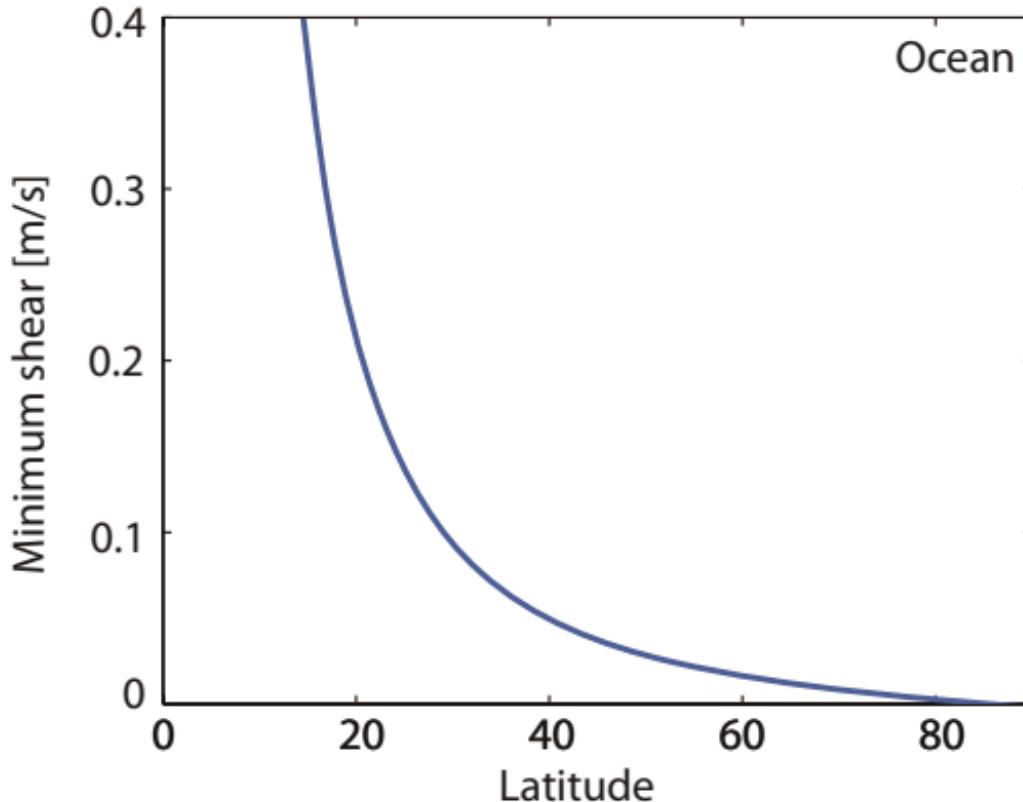
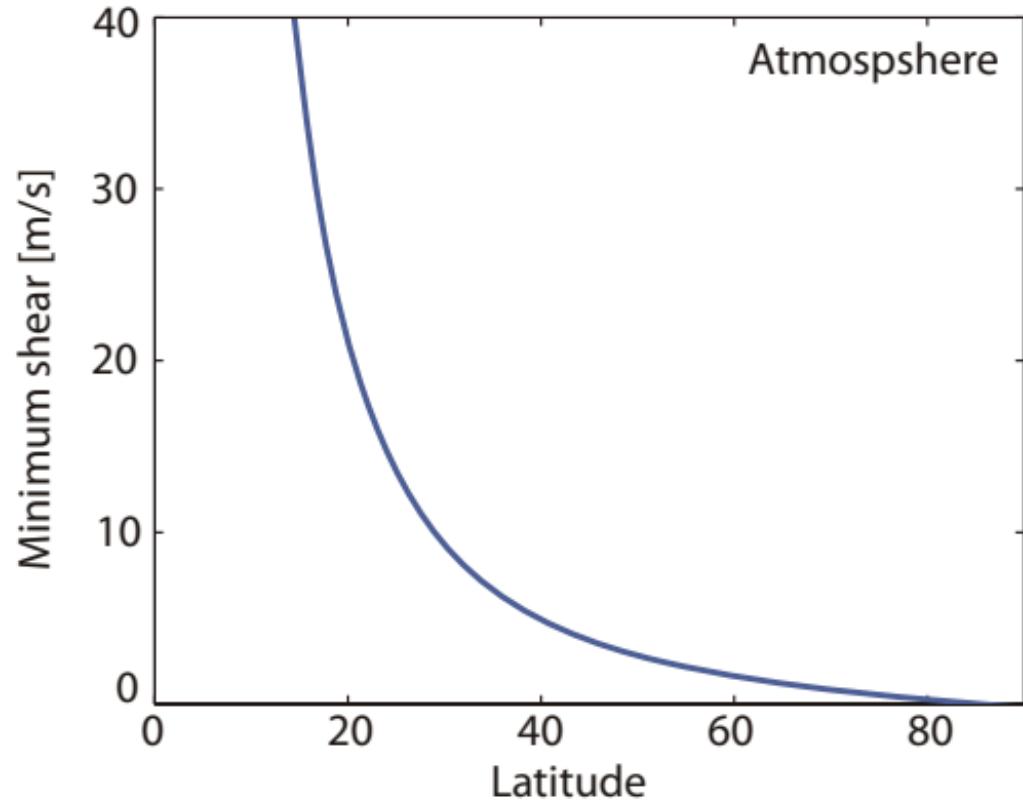


Fig. 9.16

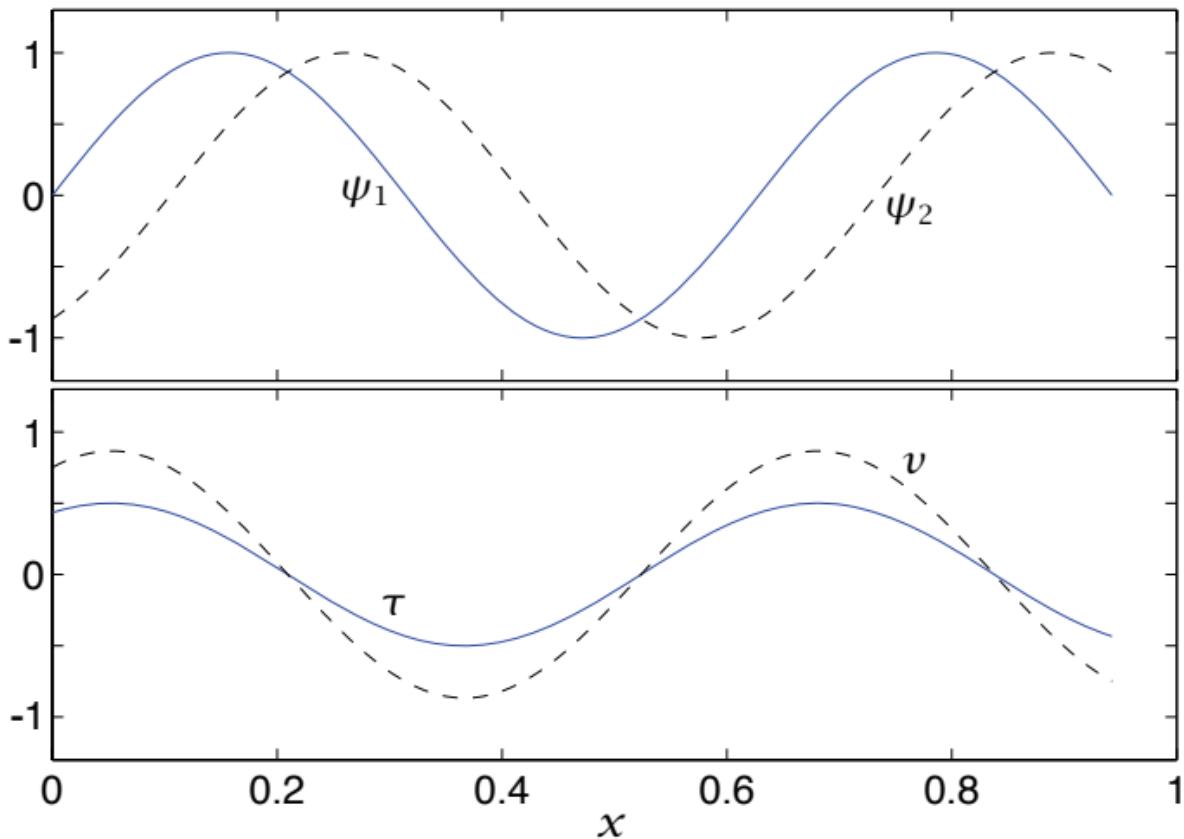


Fig. 9.17

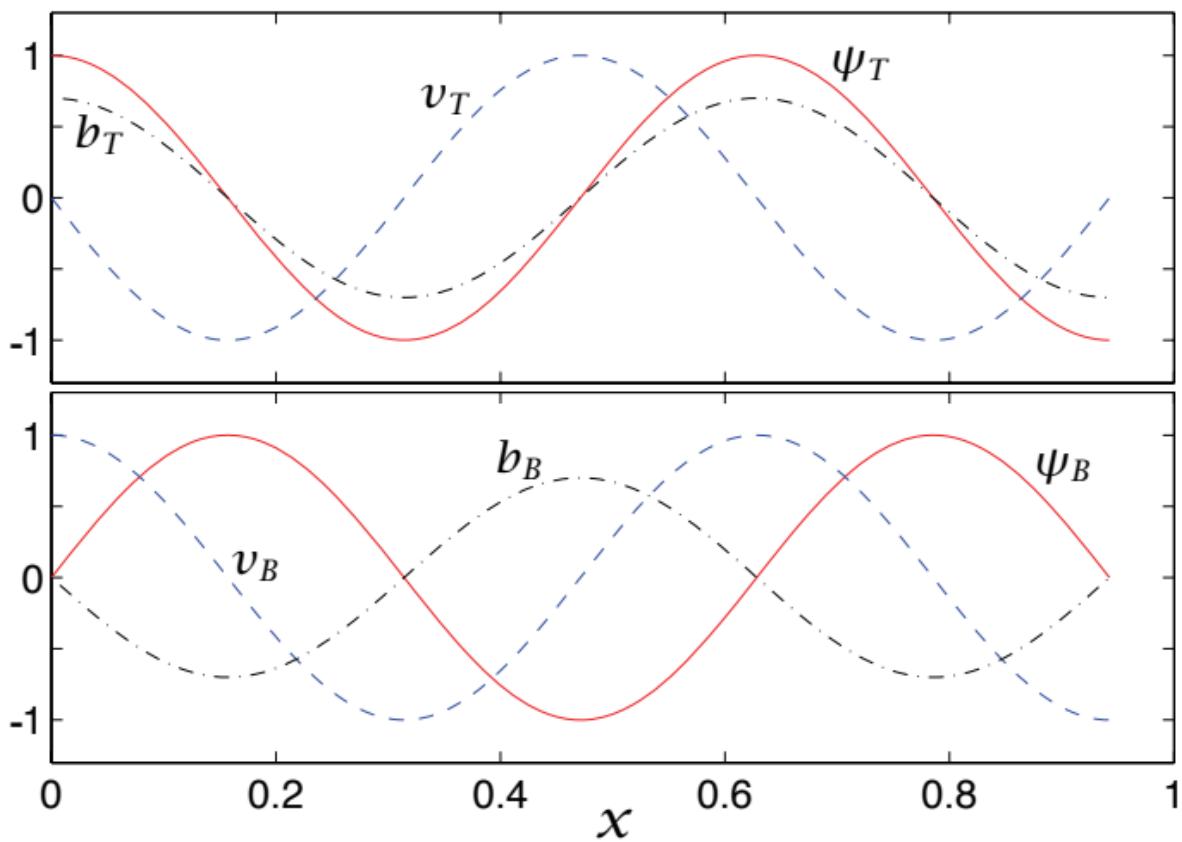


Fig. 9.18

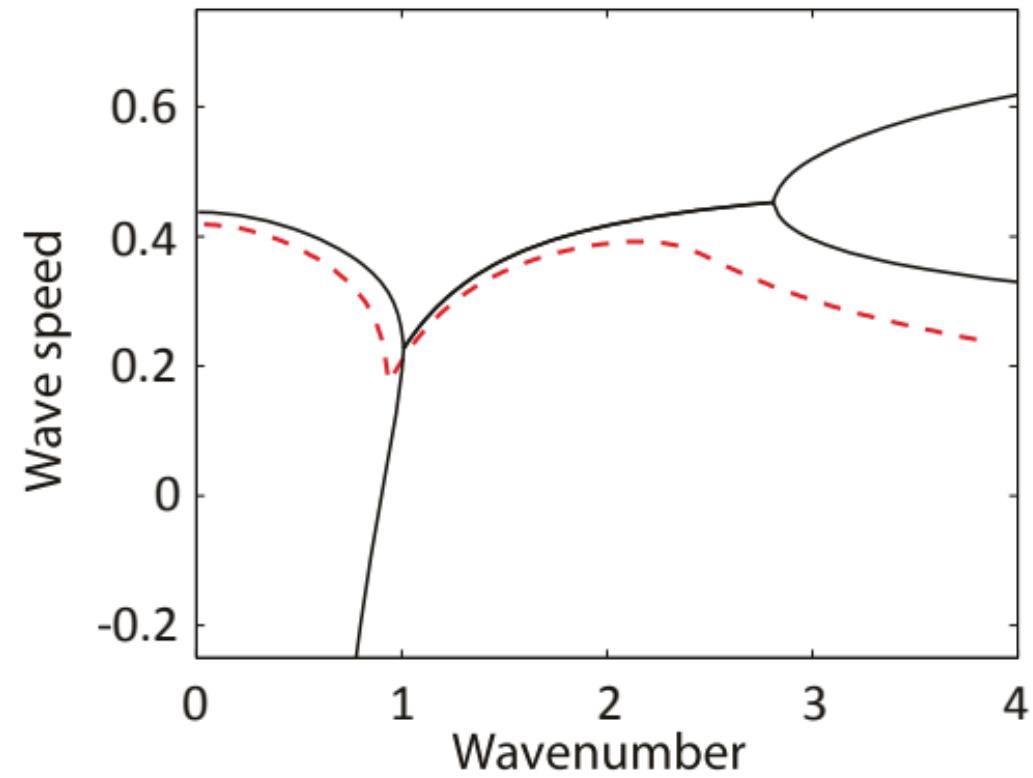
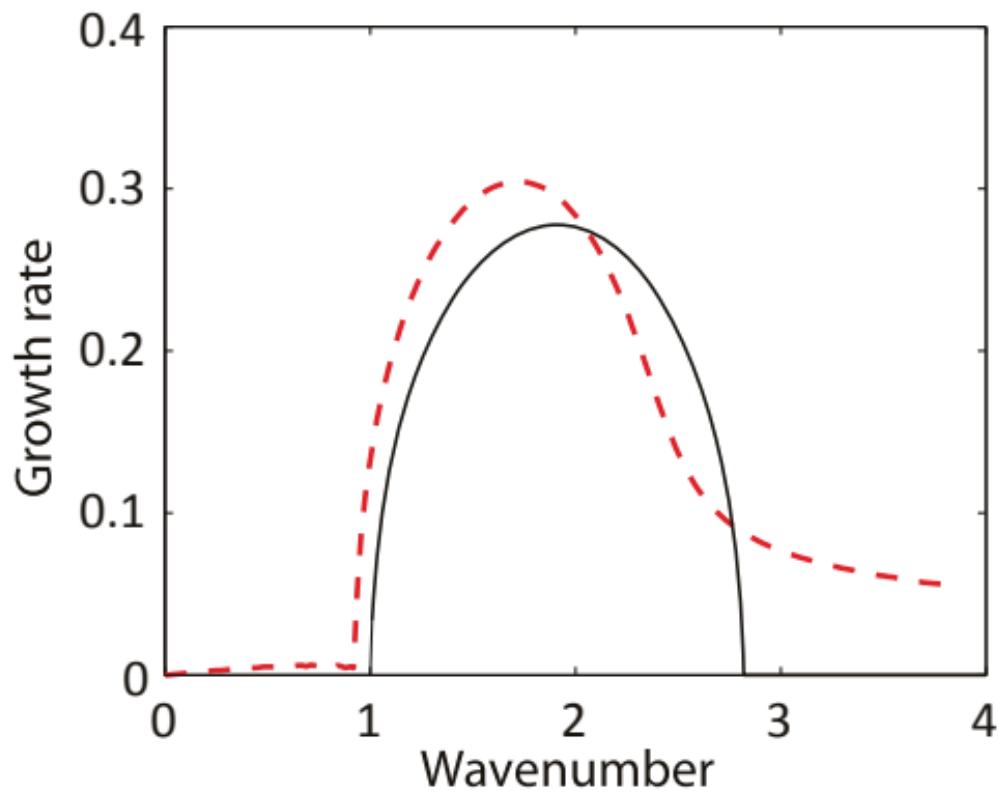


Fig. 9.19

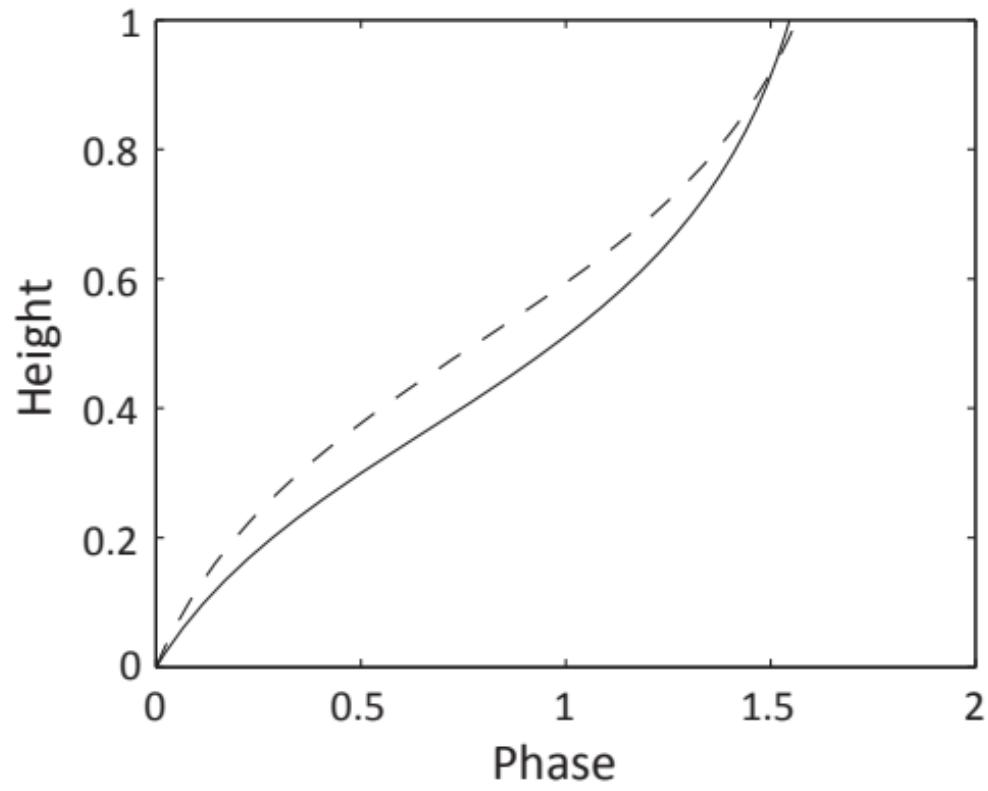
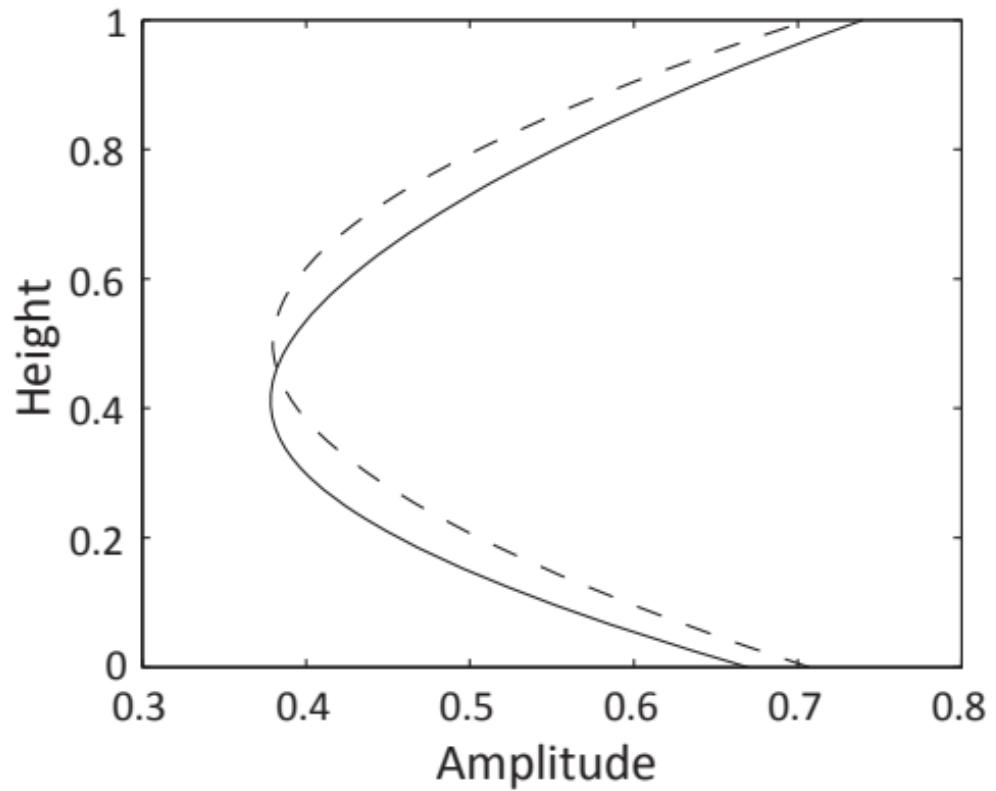


Fig. 9.20

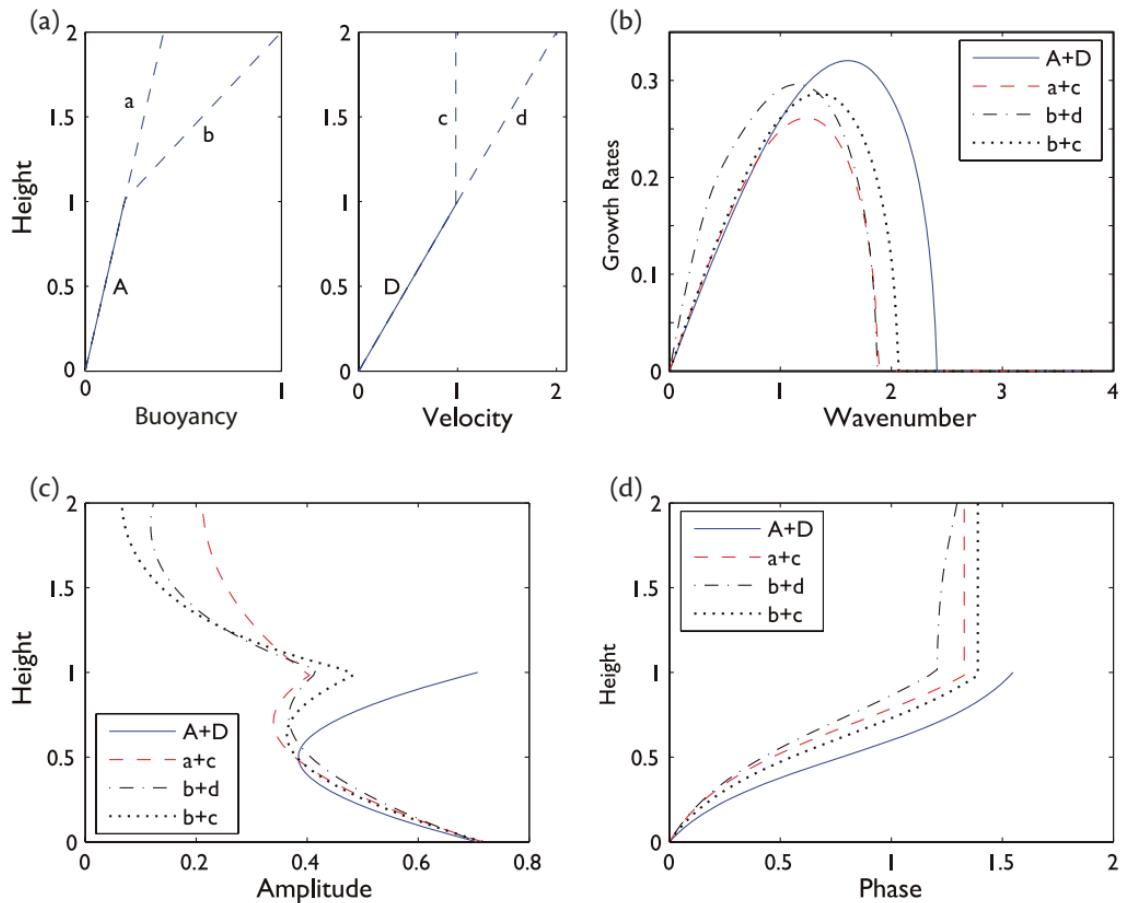


Fig. 9.21

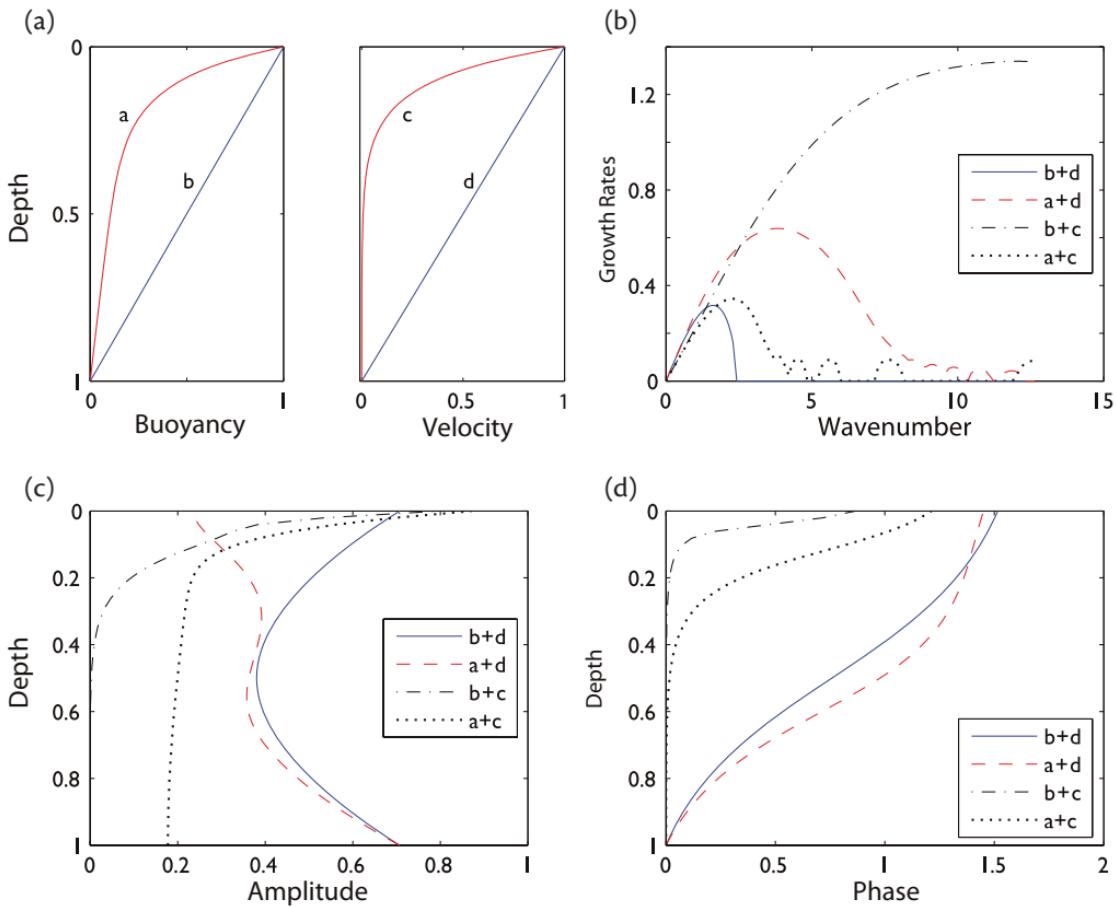


Fig. 9.22

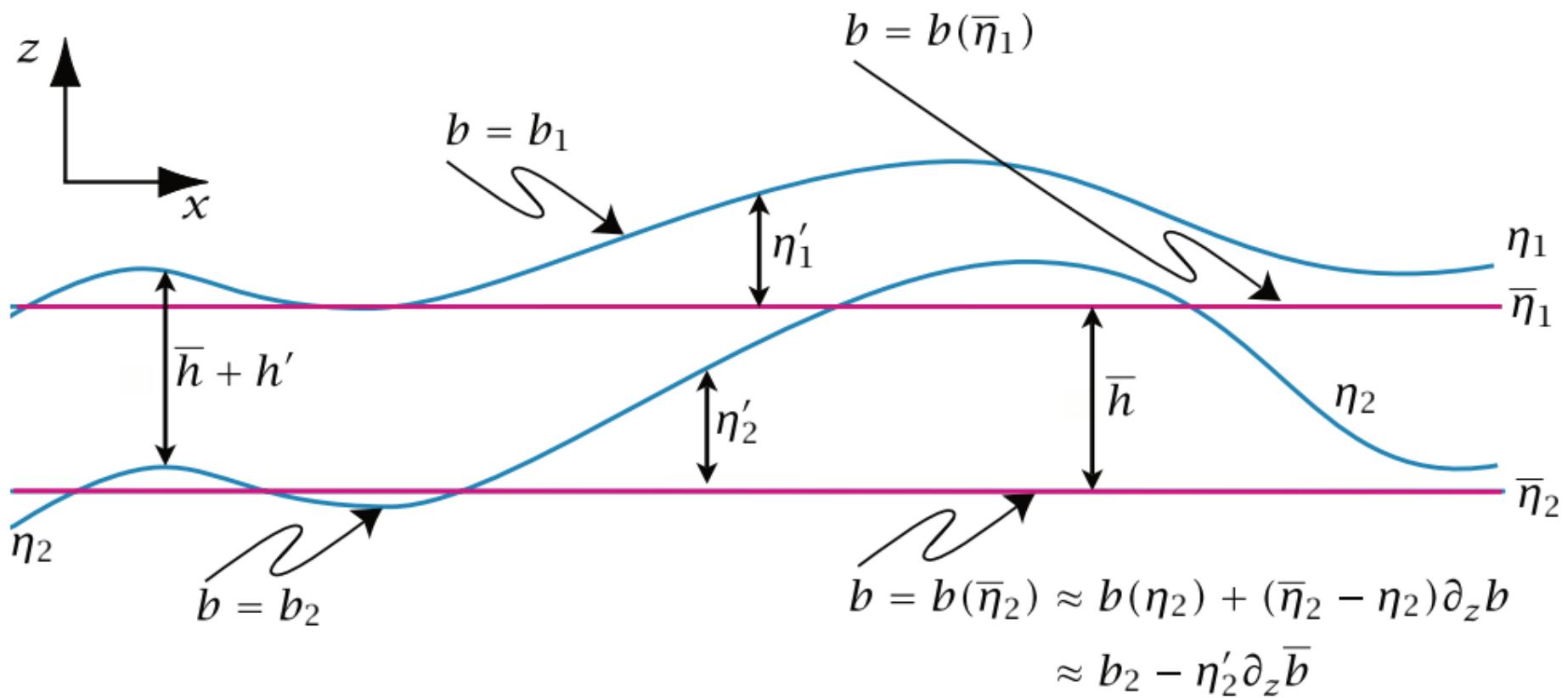


Fig. 10.1

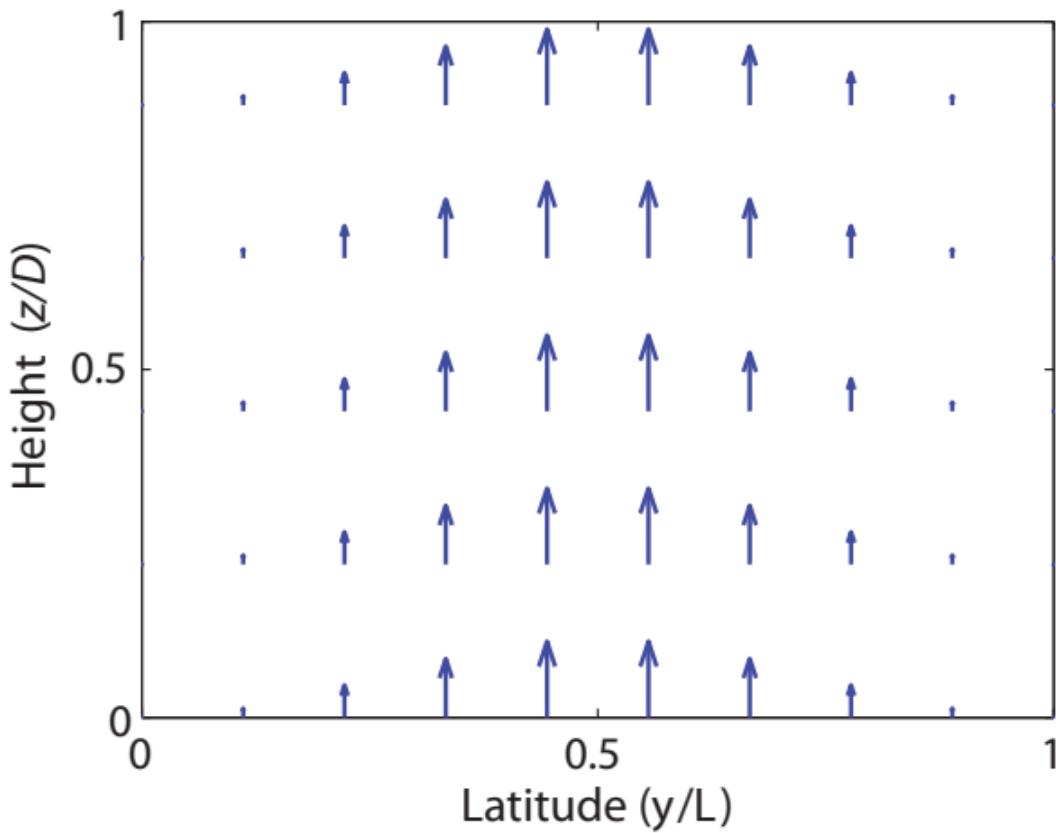


Fig. 10.2

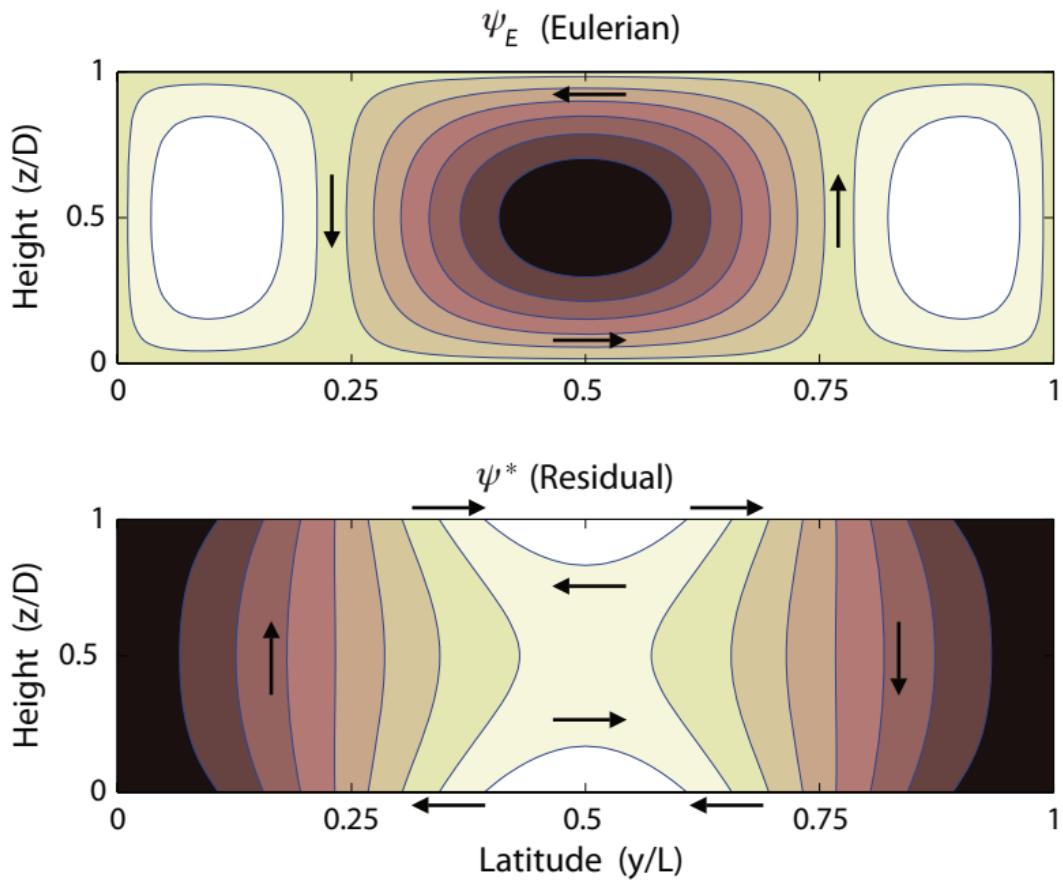


Fig. 10.3

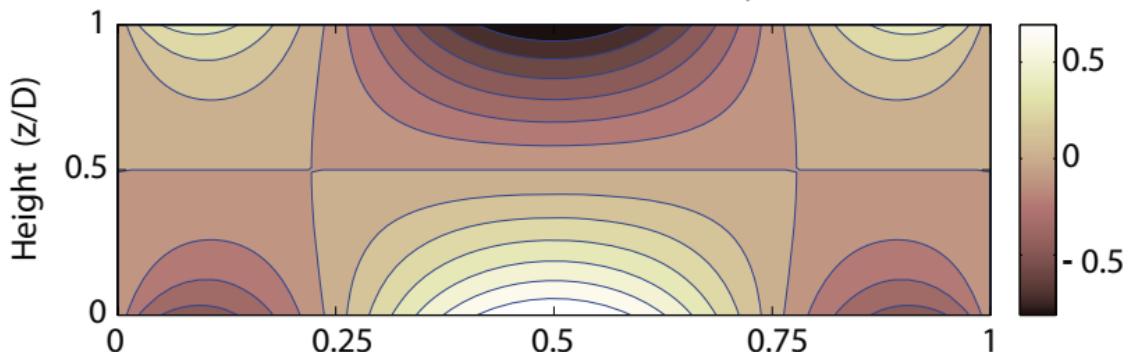
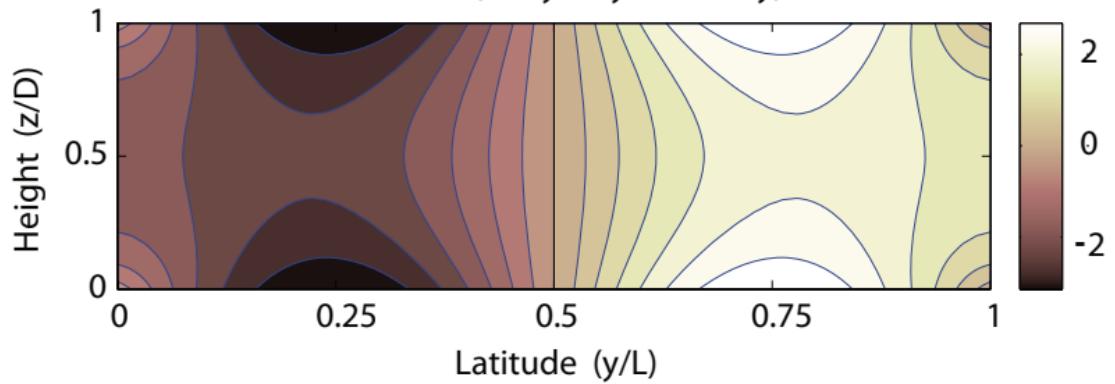
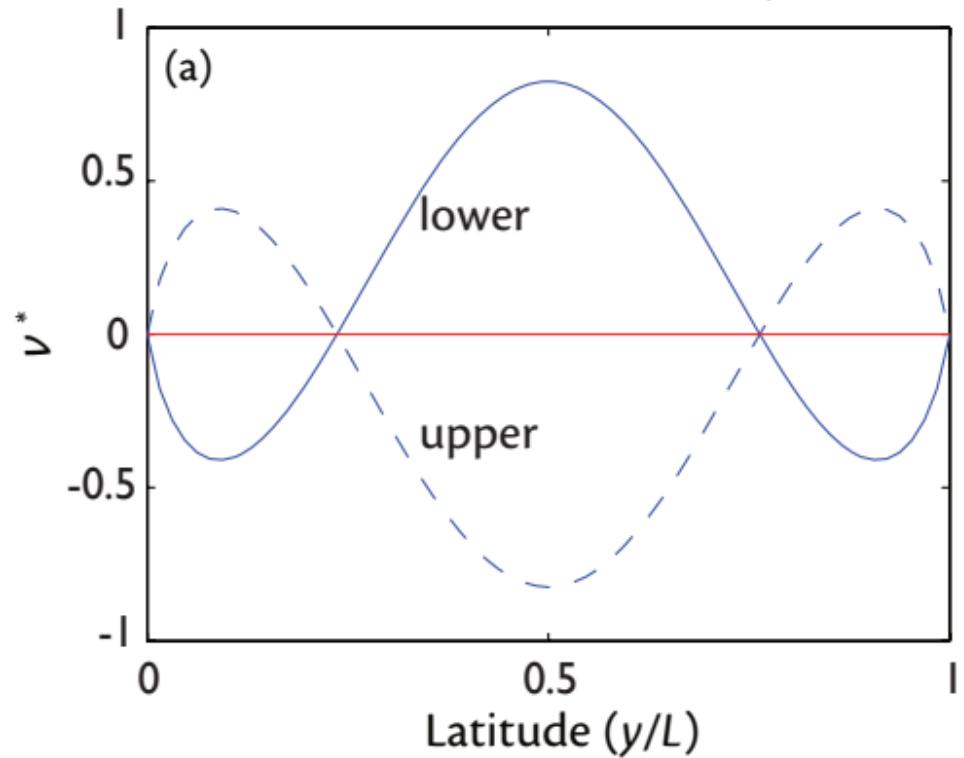
v^* (mean flow tendency) $-w^*$ (buoyancy tendency)

Fig. 10.4

Zonal flow tendency



Buoyancy tendency

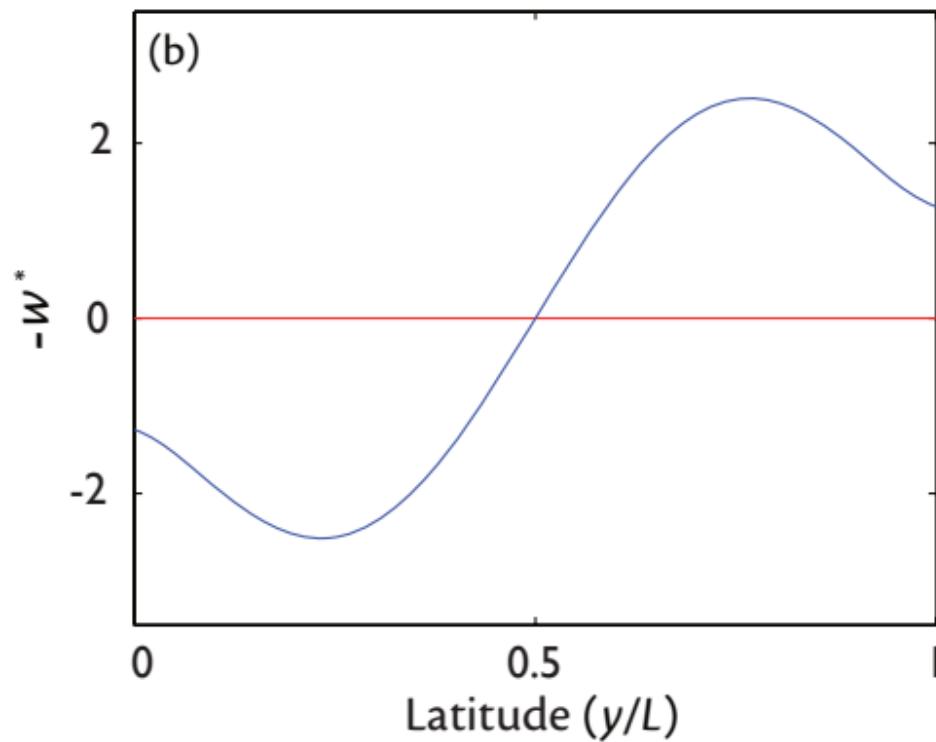


Fig. 10.5

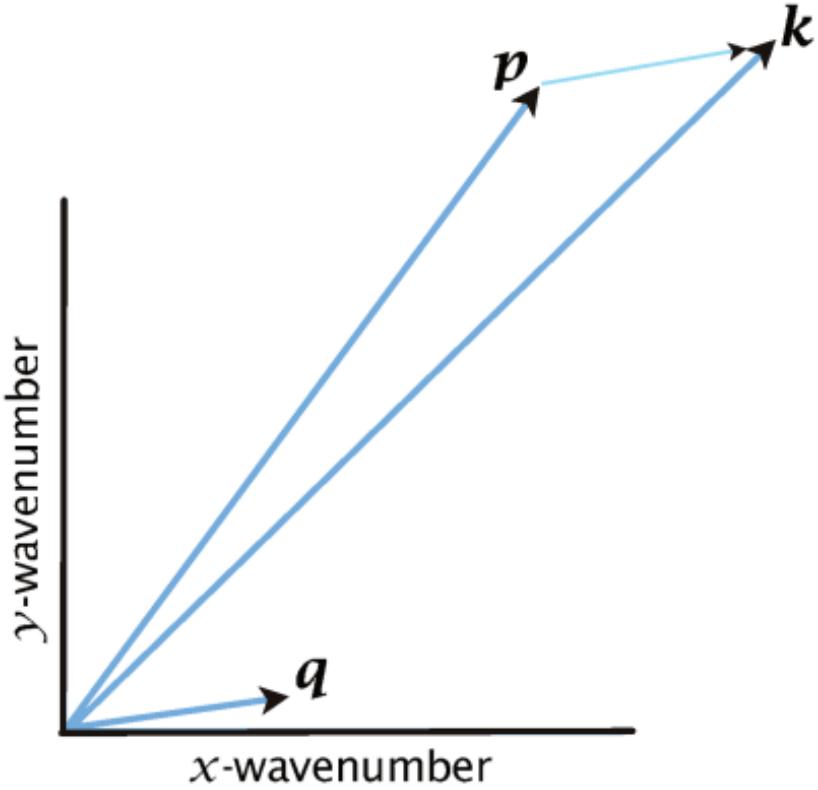
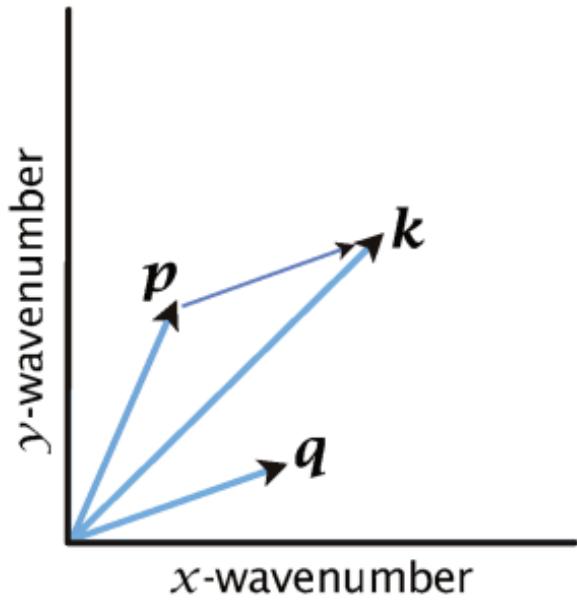


Fig. 11.1

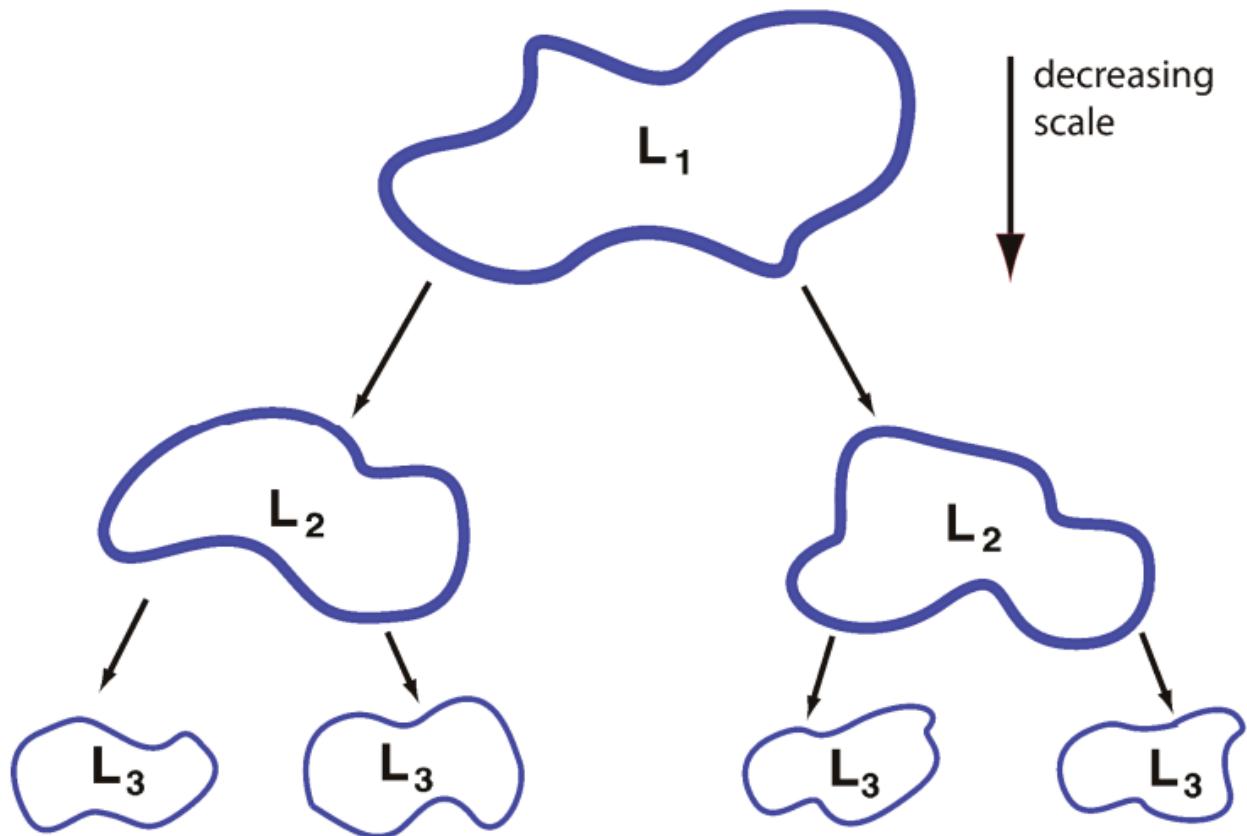


Fig. 11.2

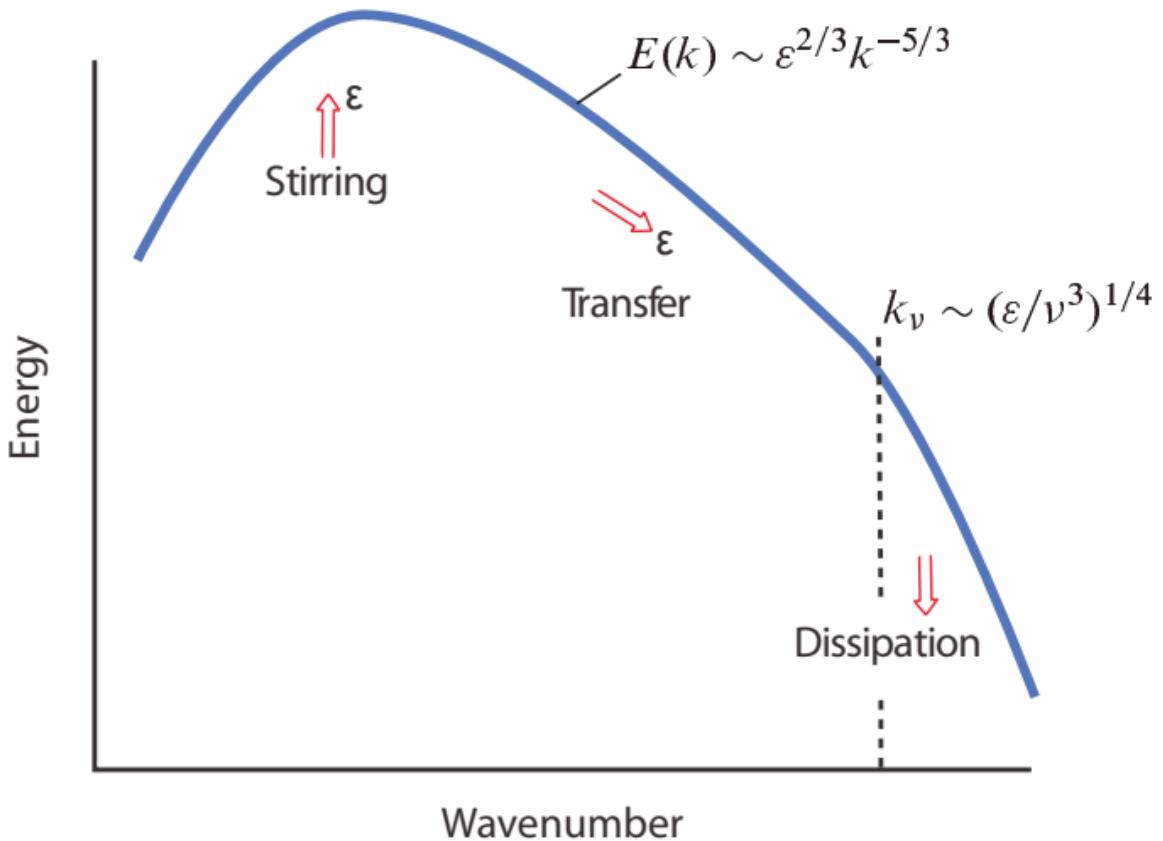


Fig. 11.3

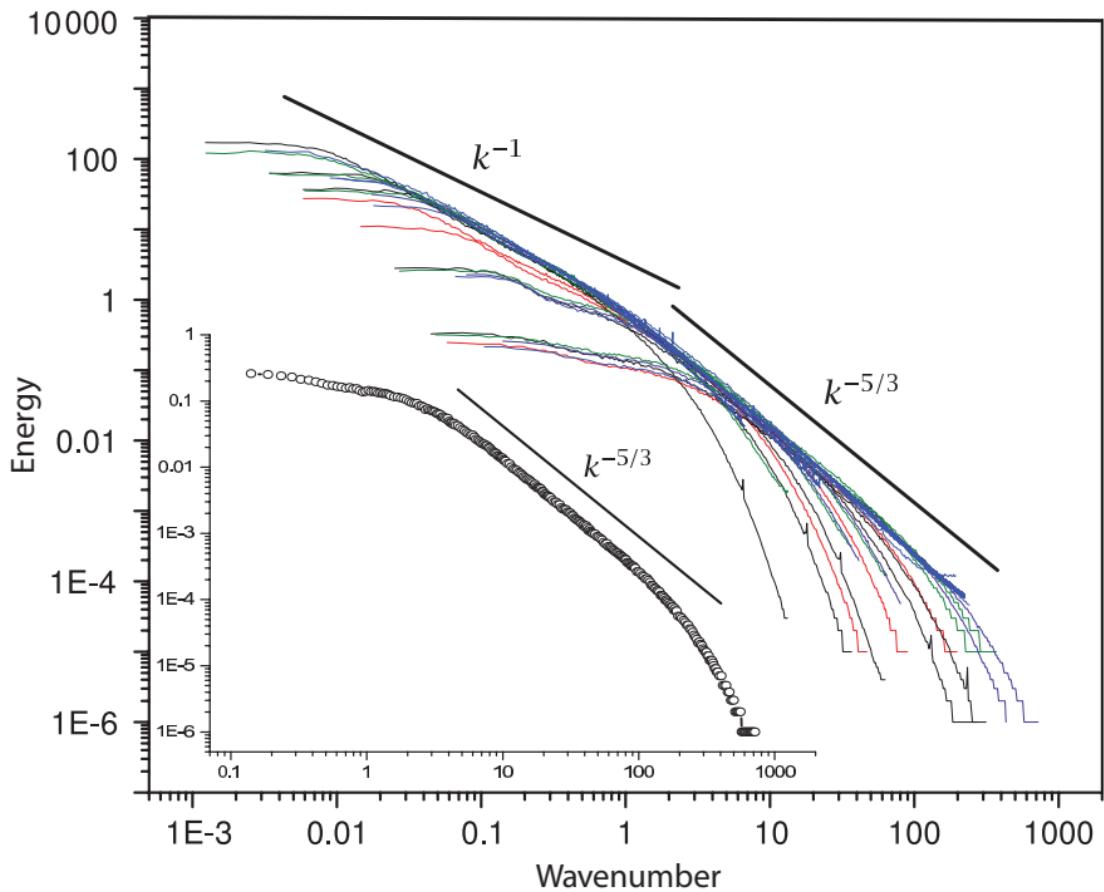
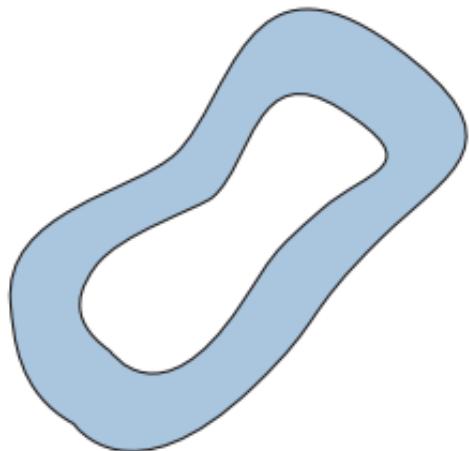


Fig. 11.4

Initial



Later

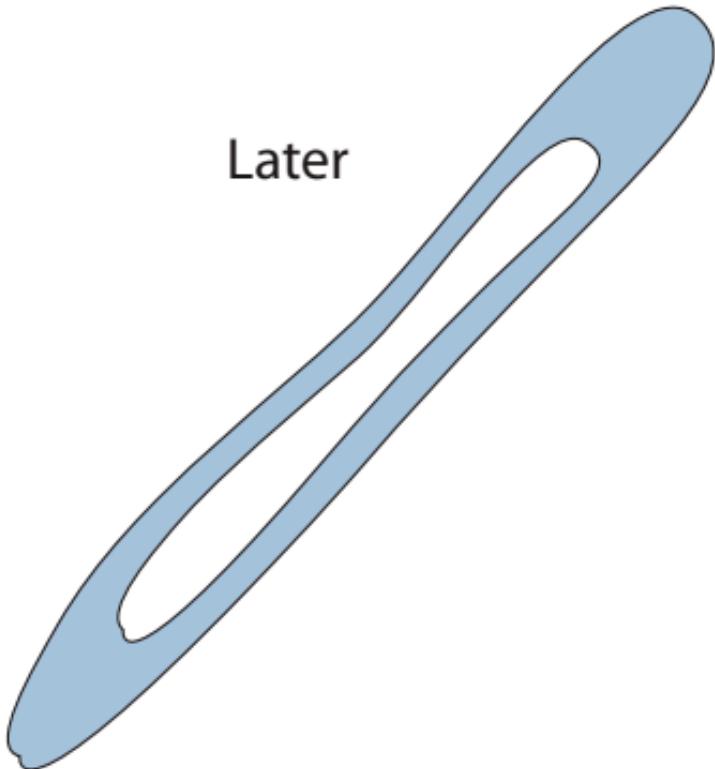


Fig. 11.5

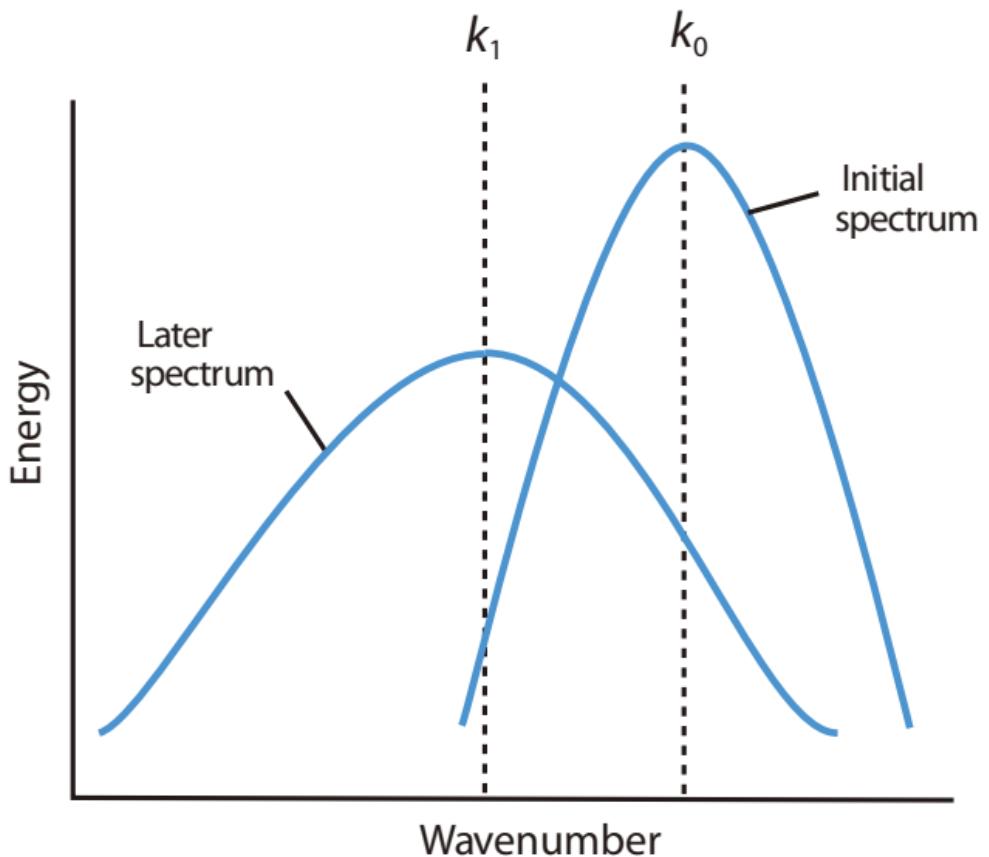


Fig. 11.6

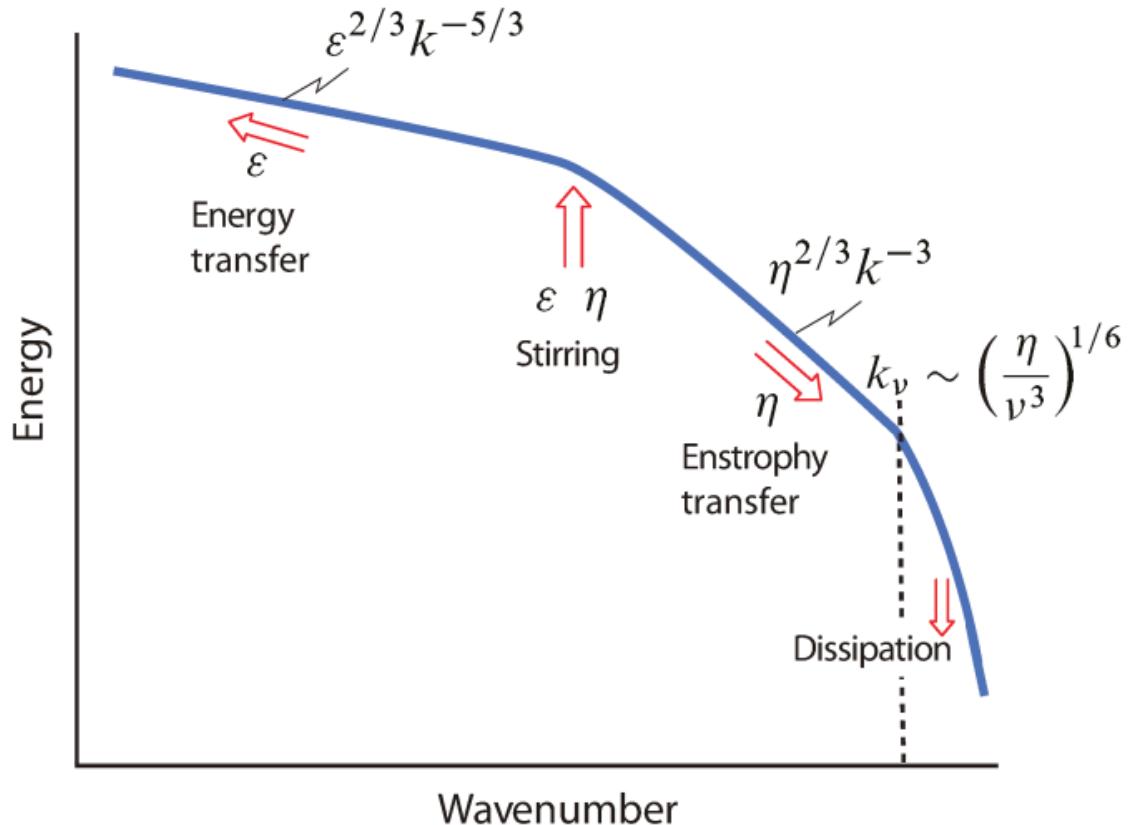


Fig. 11.7

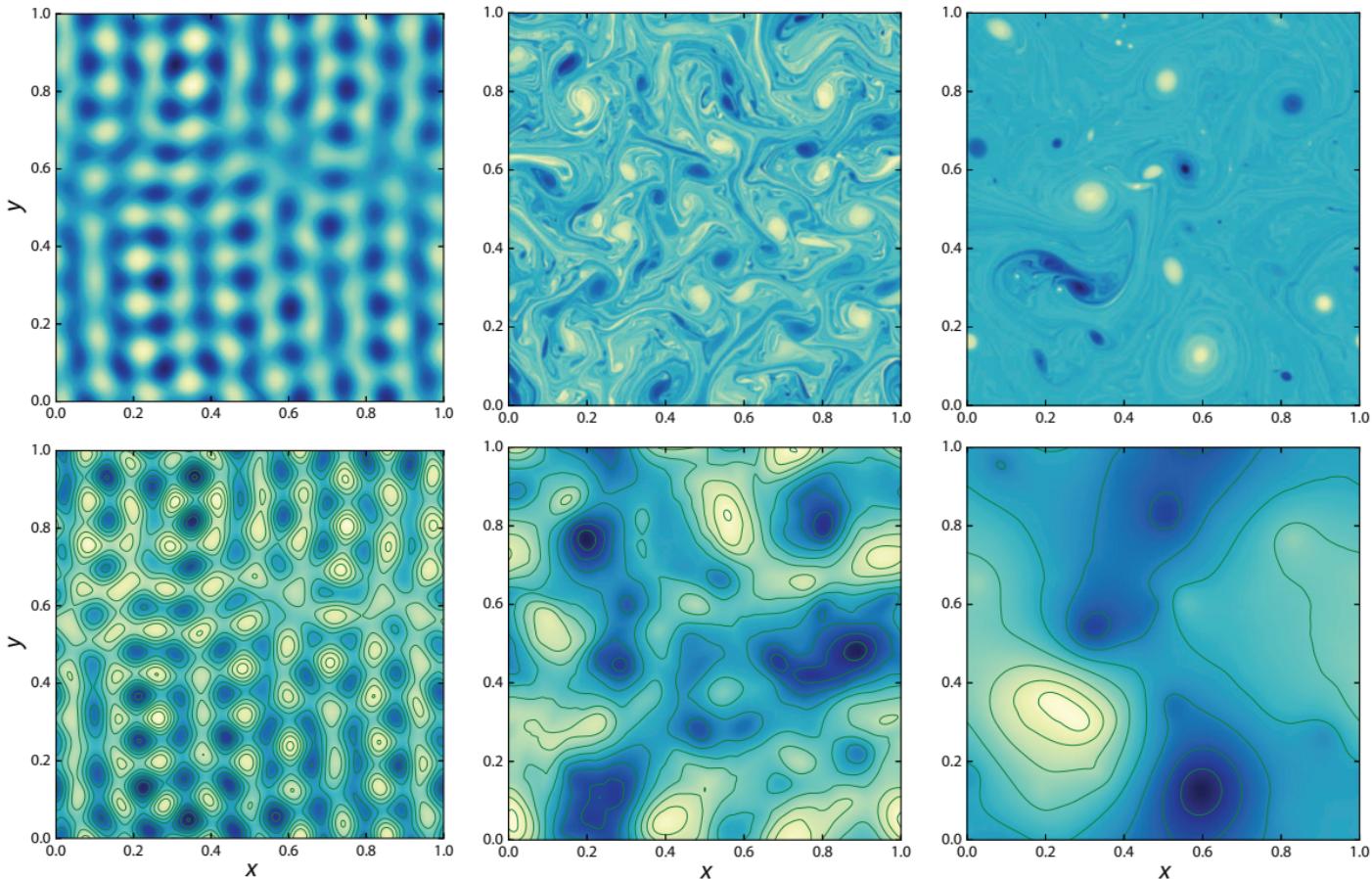


Fig. 11.8

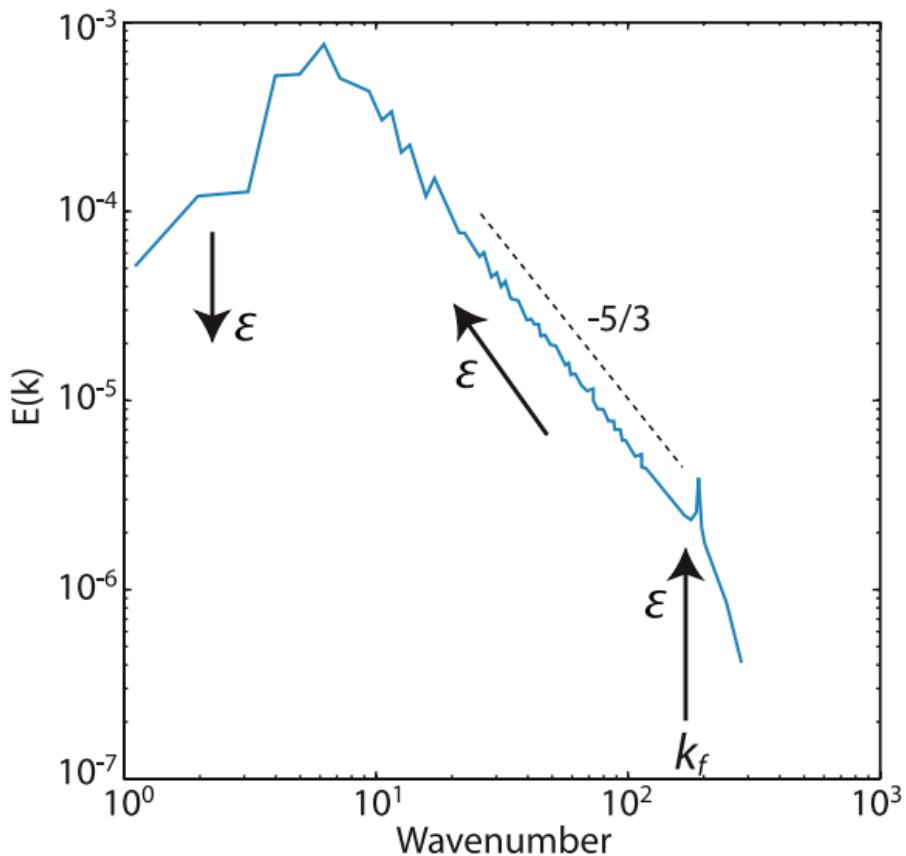


Fig. 11.9

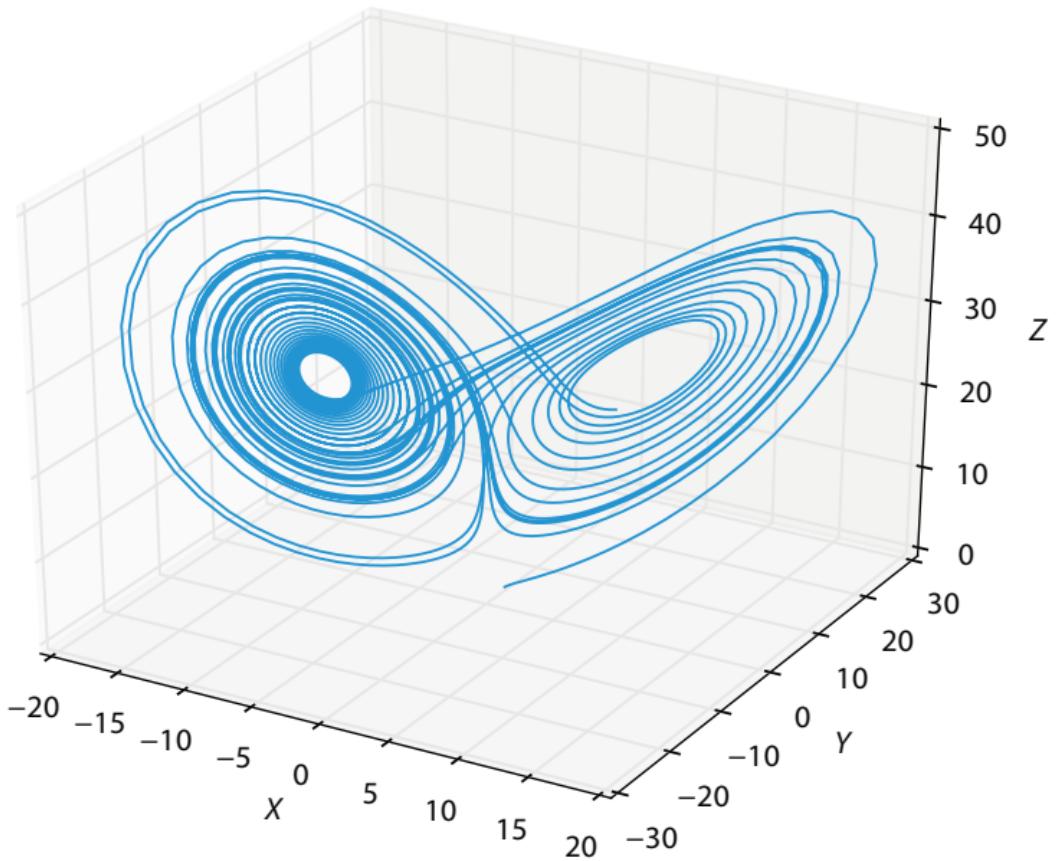


Fig. 11.10

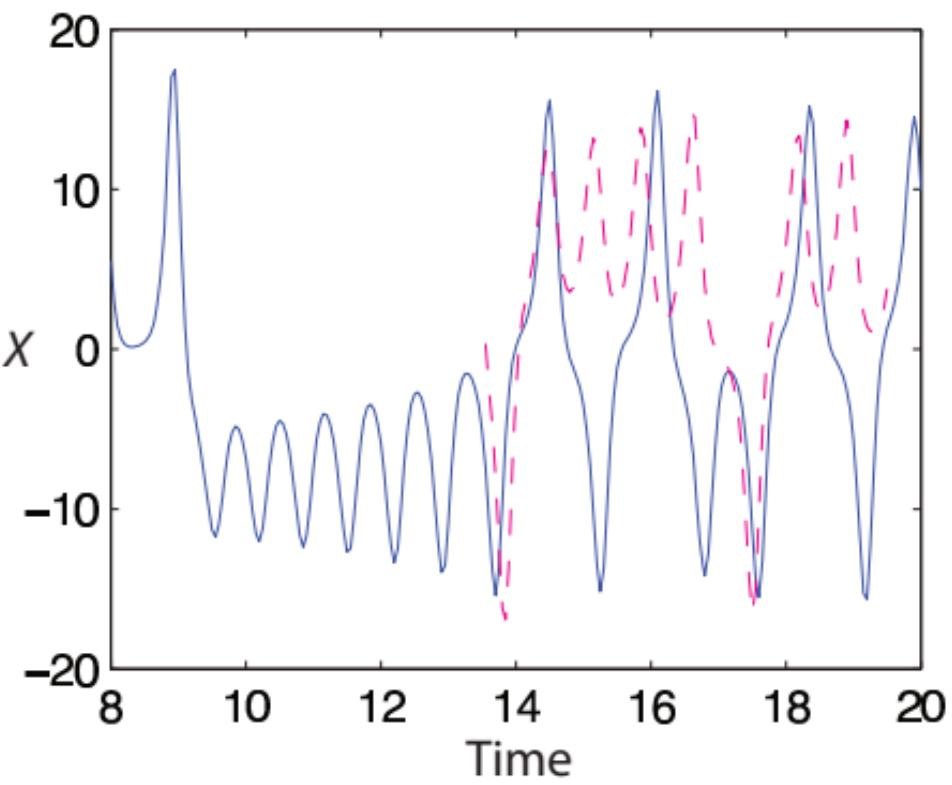
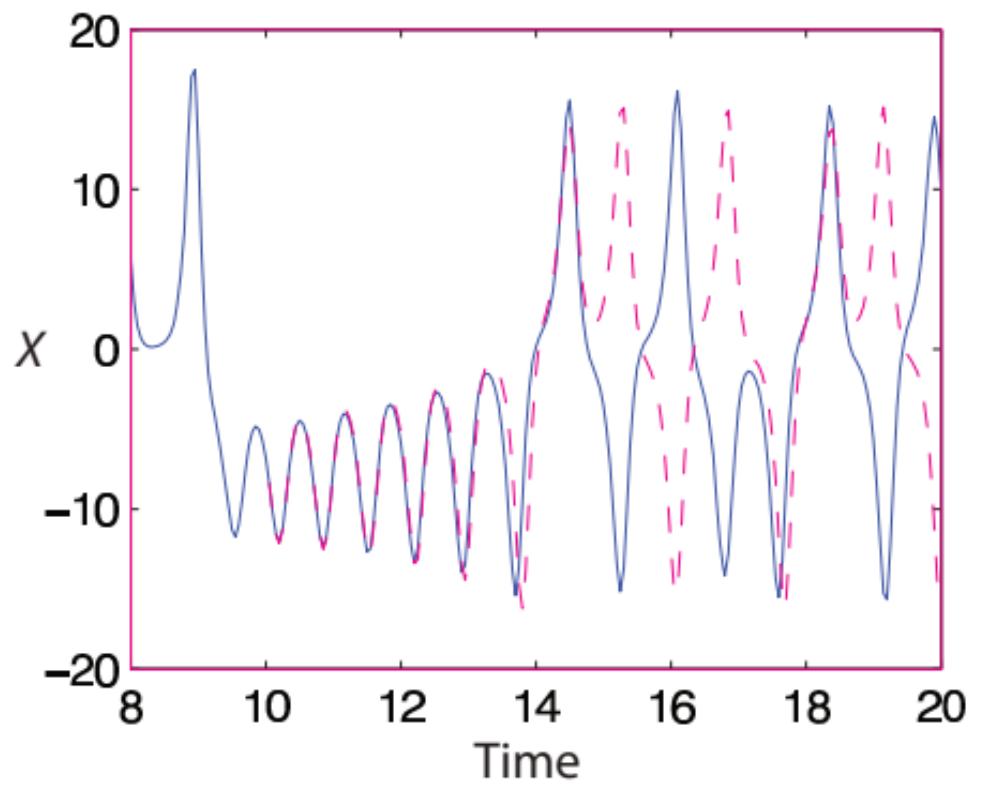


Fig. 11.11

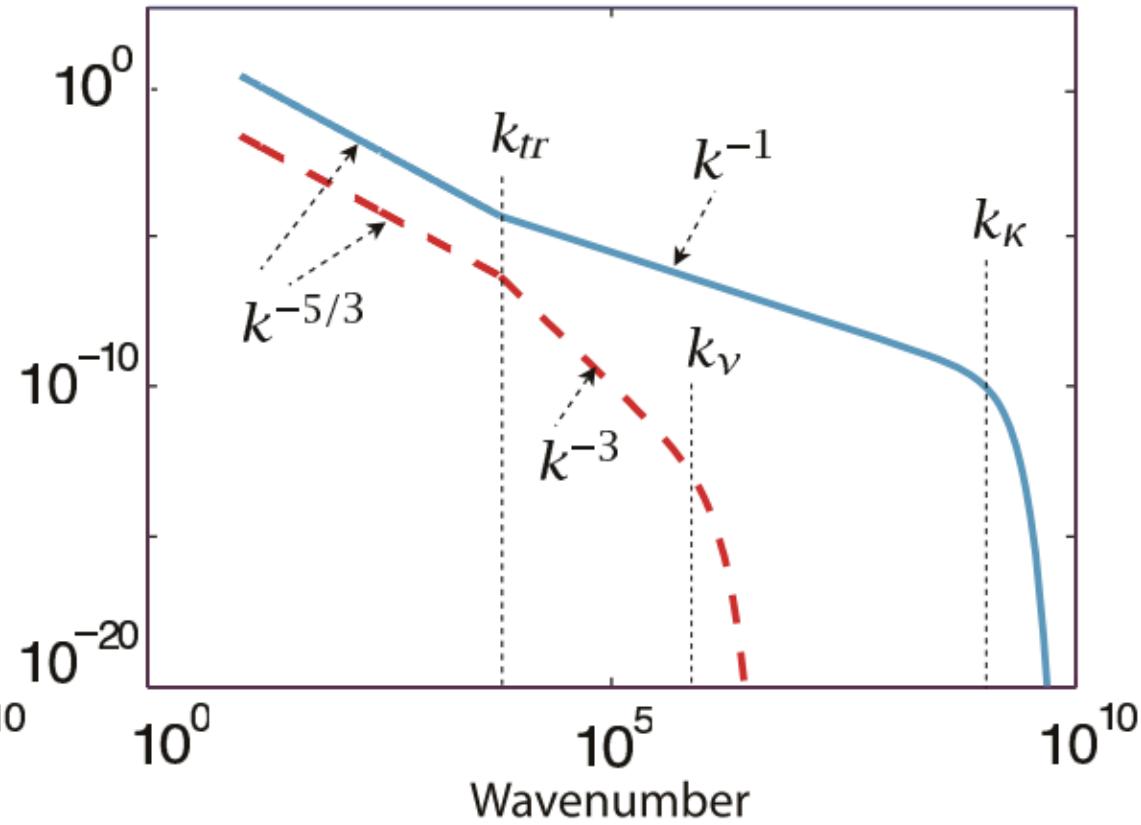
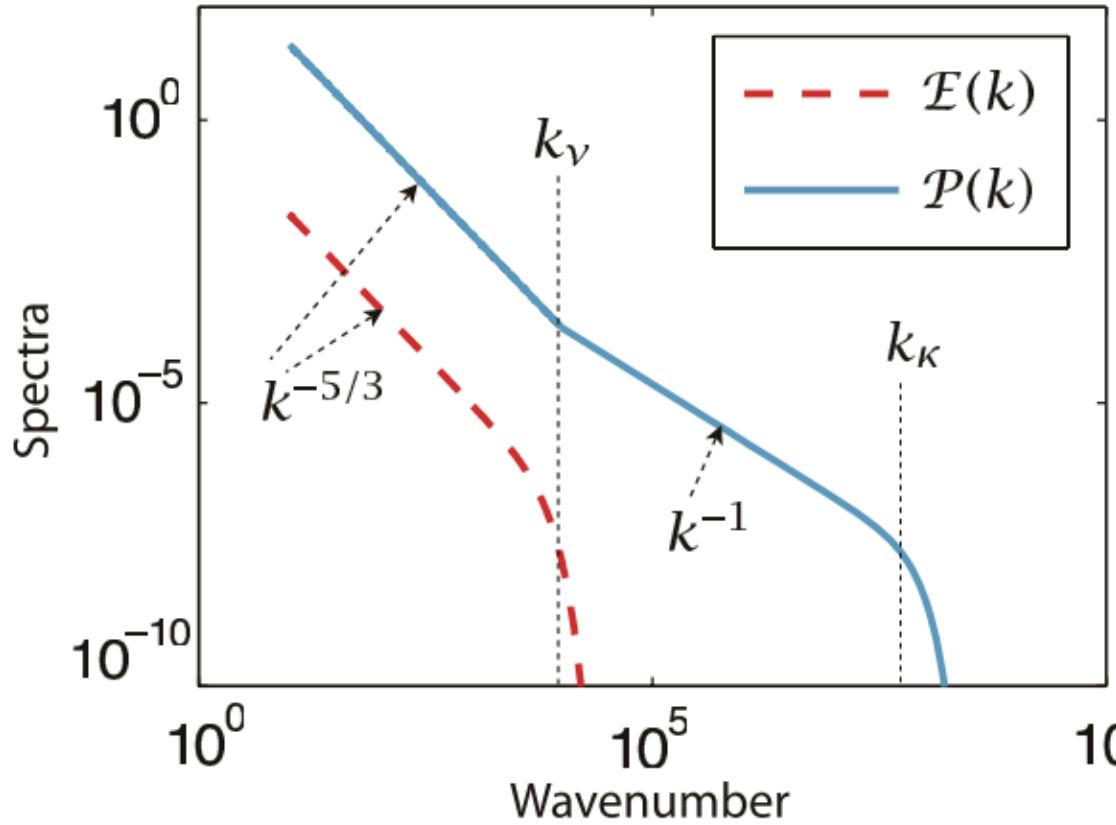


Fig. 11.12

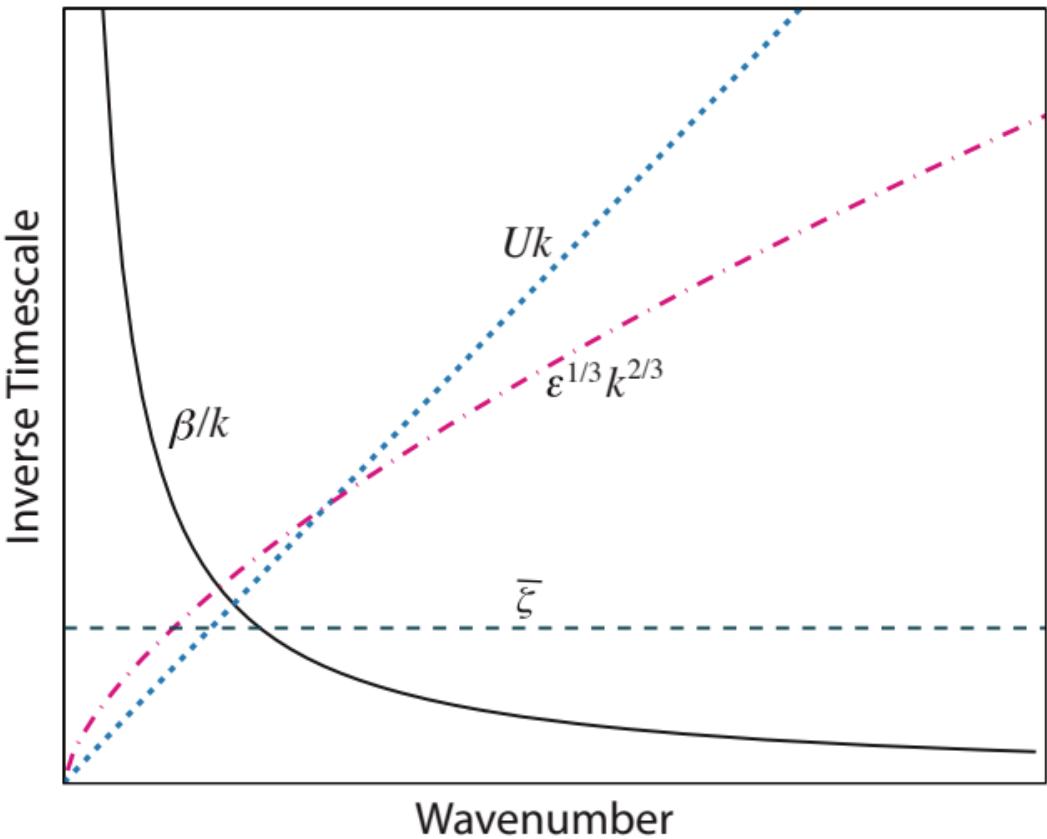


Fig. 12.1

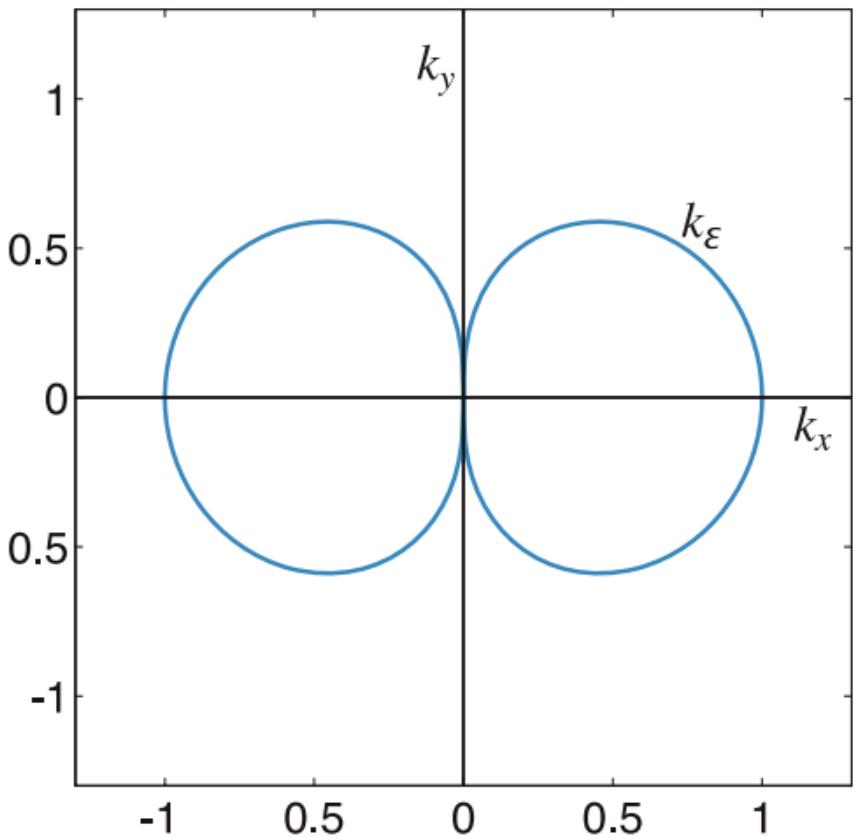


Fig. 12.2

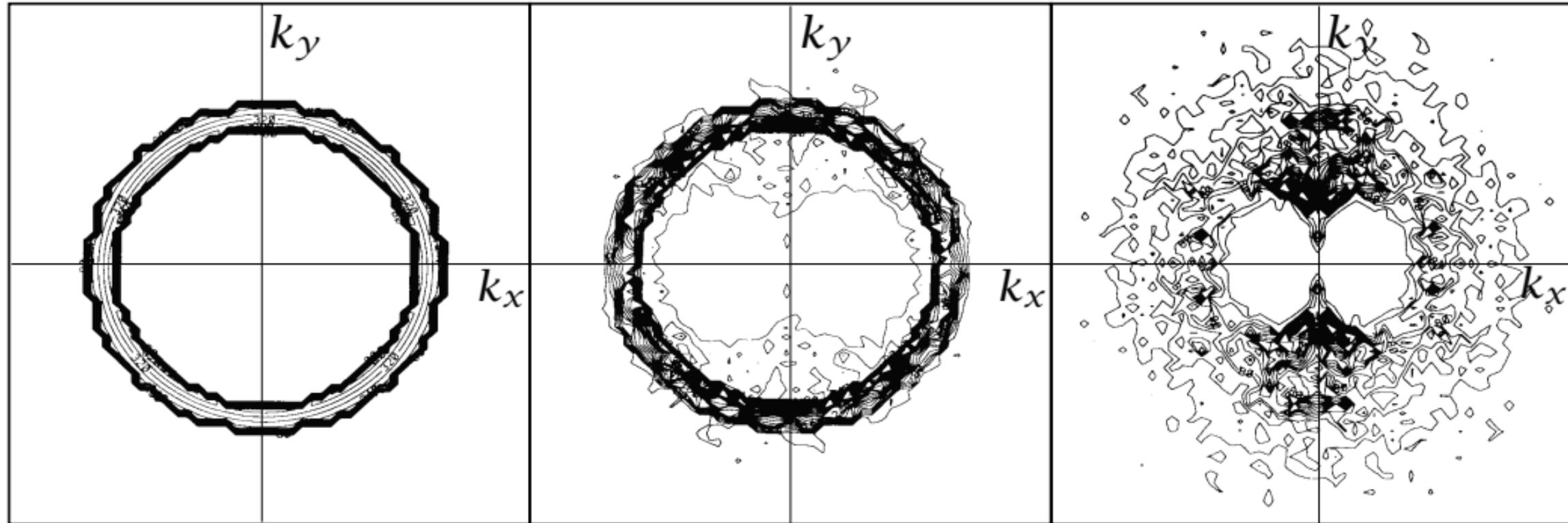


Fig. 12.3

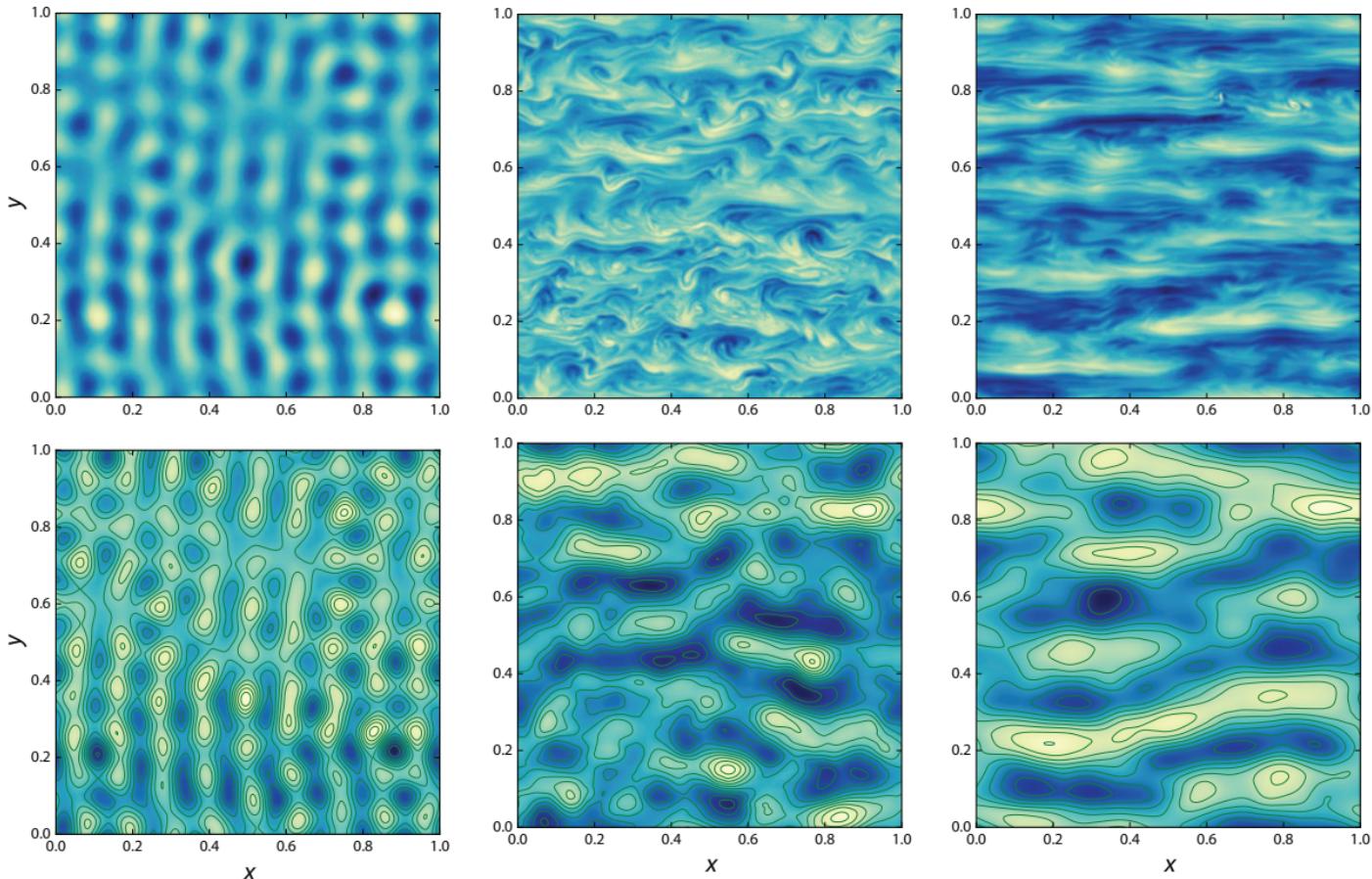


Fig. 12.4

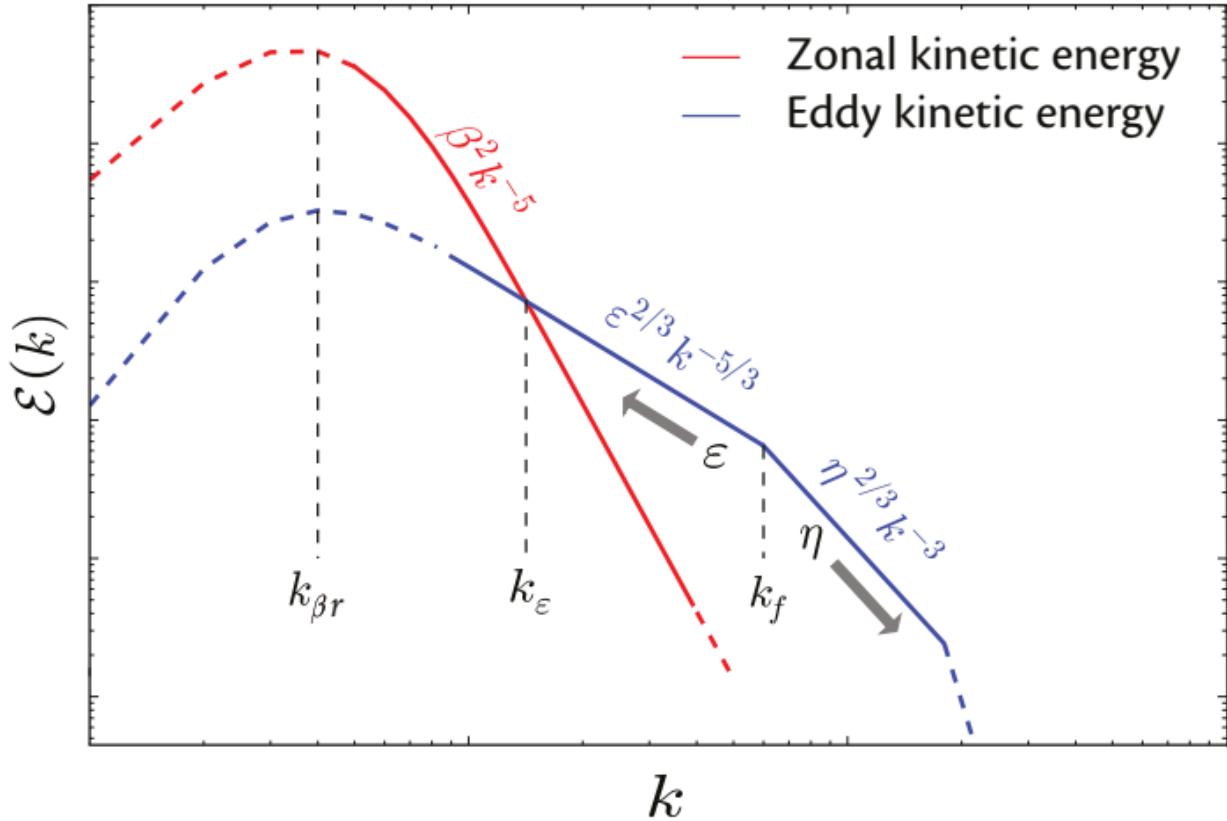


Fig. 12.5

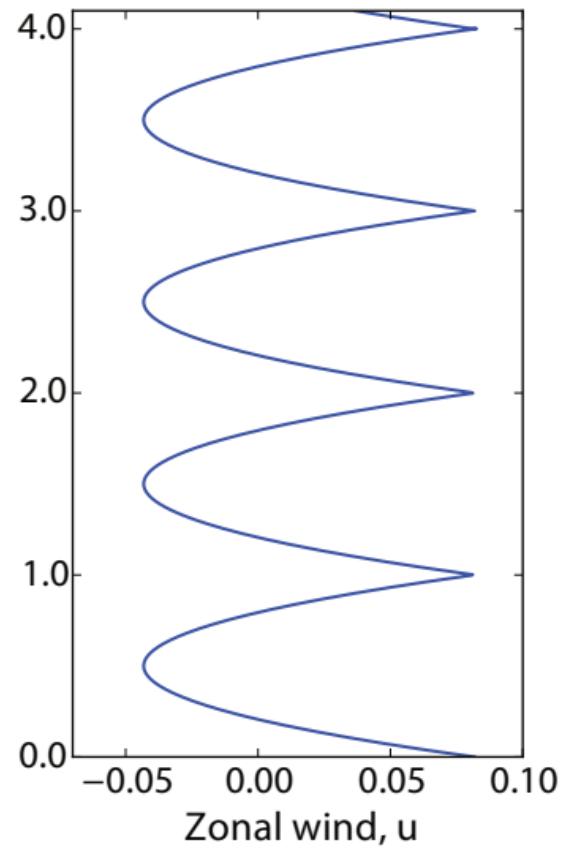
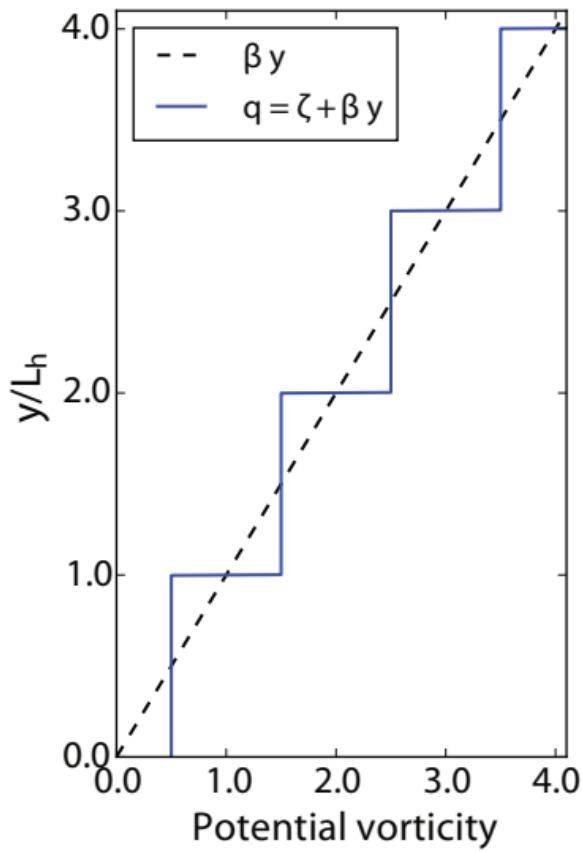


Fig. 12.6

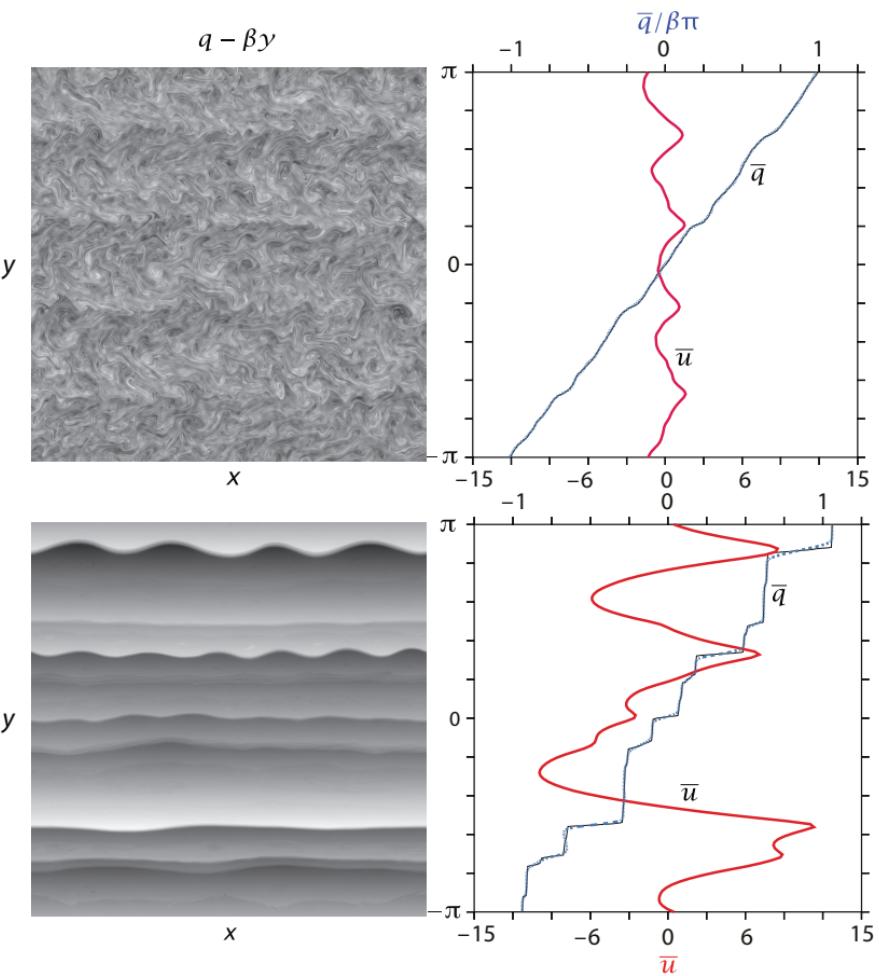


Fig. 12.7

wind or solar input

enstrophy flux
energy flux

baroclinic energy

scattering into
3D turbulence

k_d

k_0

barotropic energy

k_{3D}

loss to boundary layer friction

Fig. 12.8

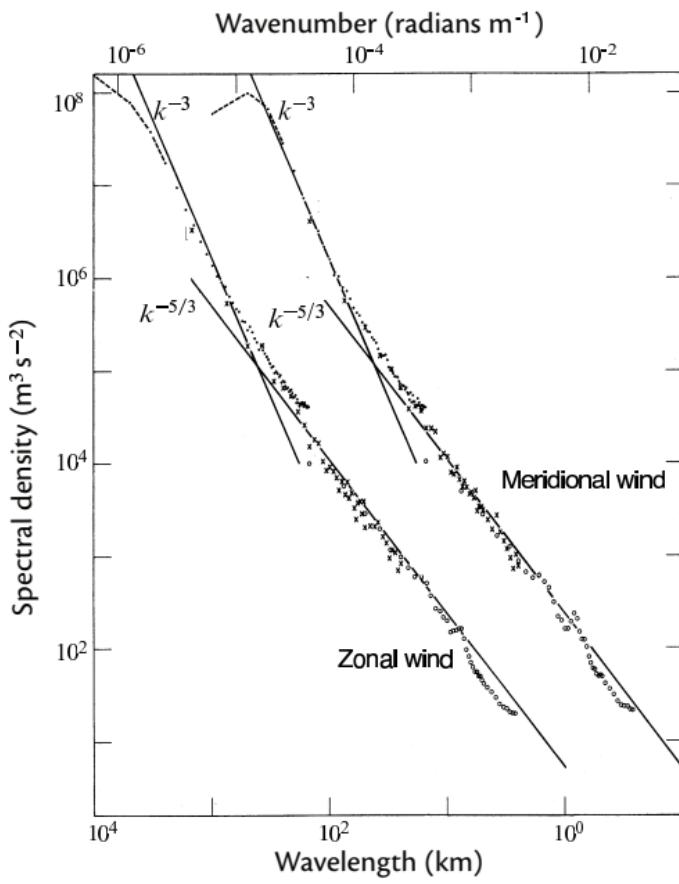


Fig. 12.9

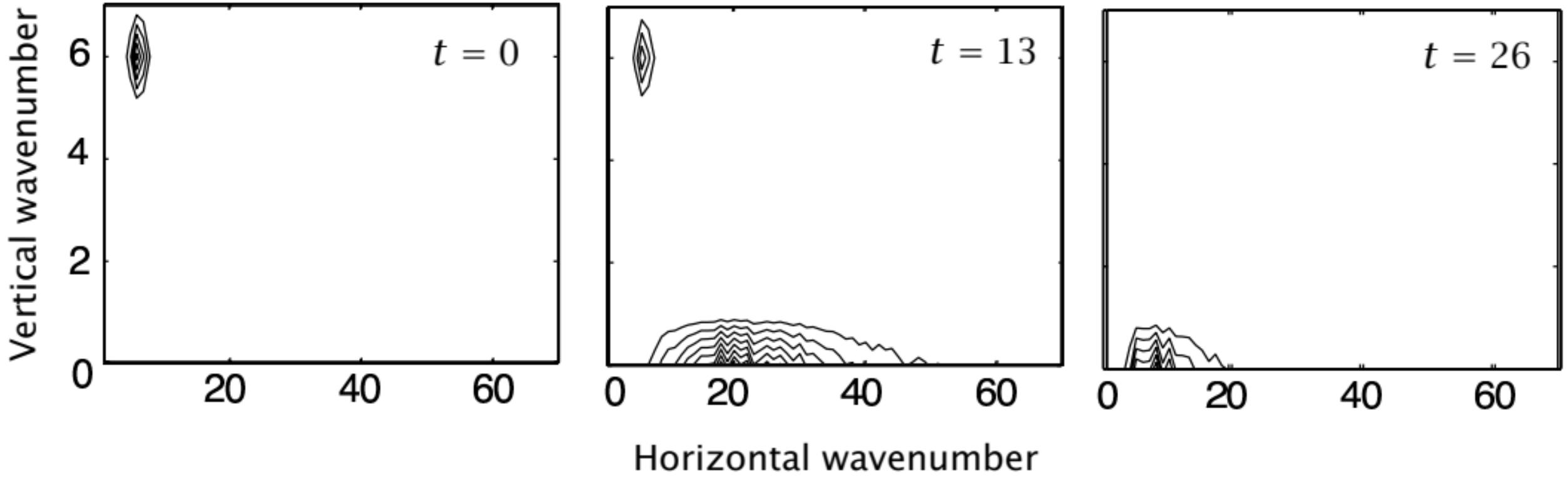


Fig. 12.10

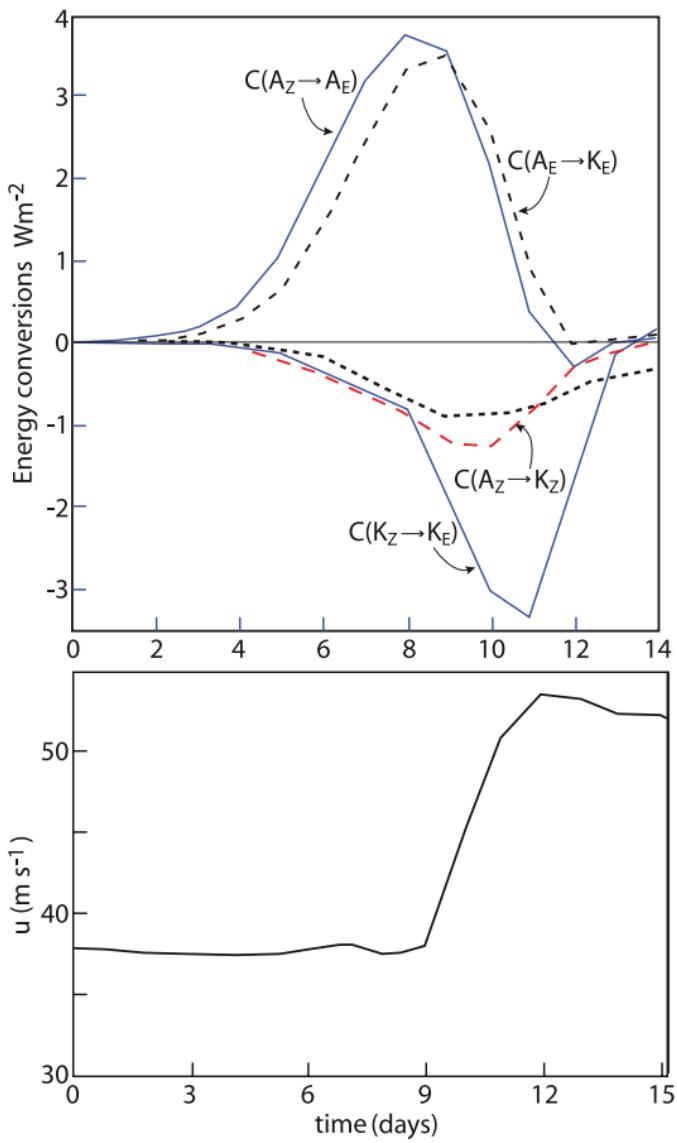


Fig. 12.11

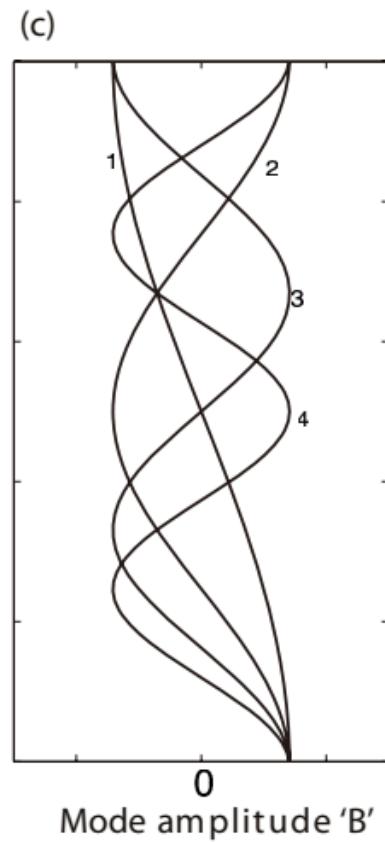
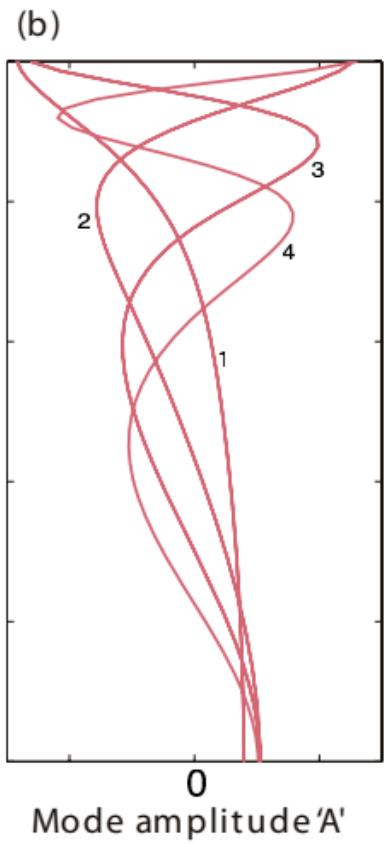
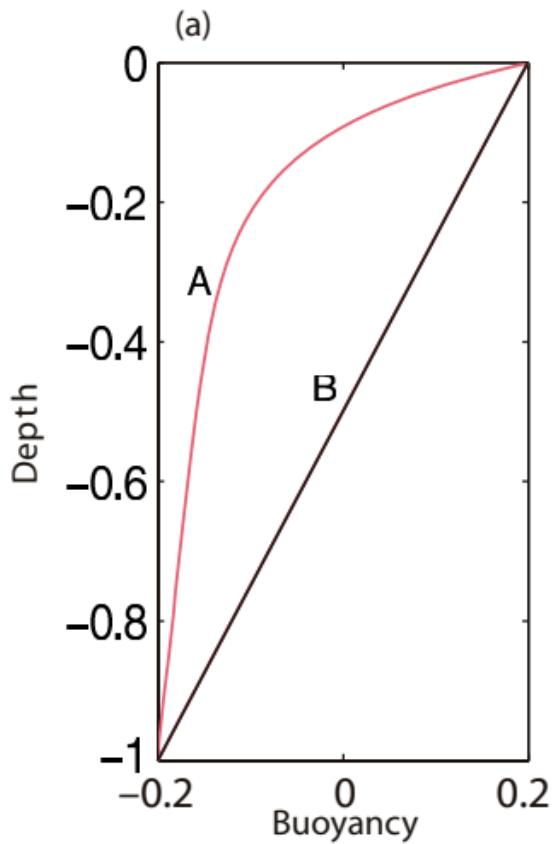


Fig. 12.12

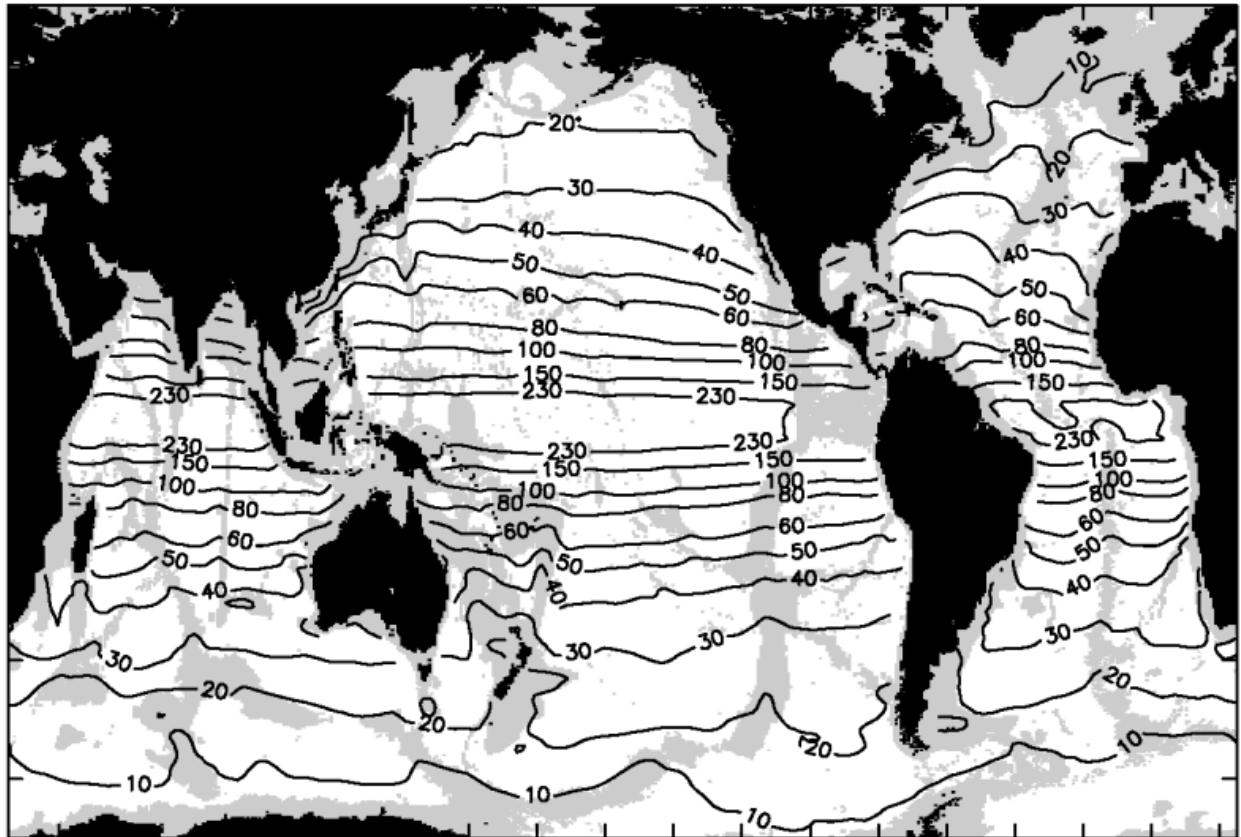


Fig. 12.13

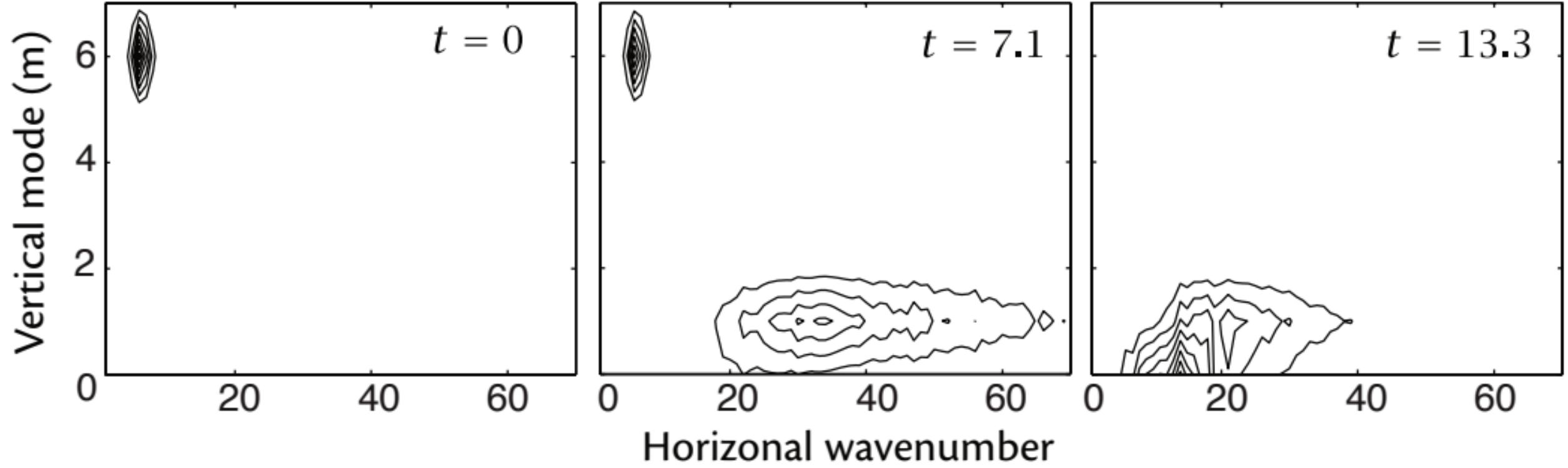


Fig. 12.14

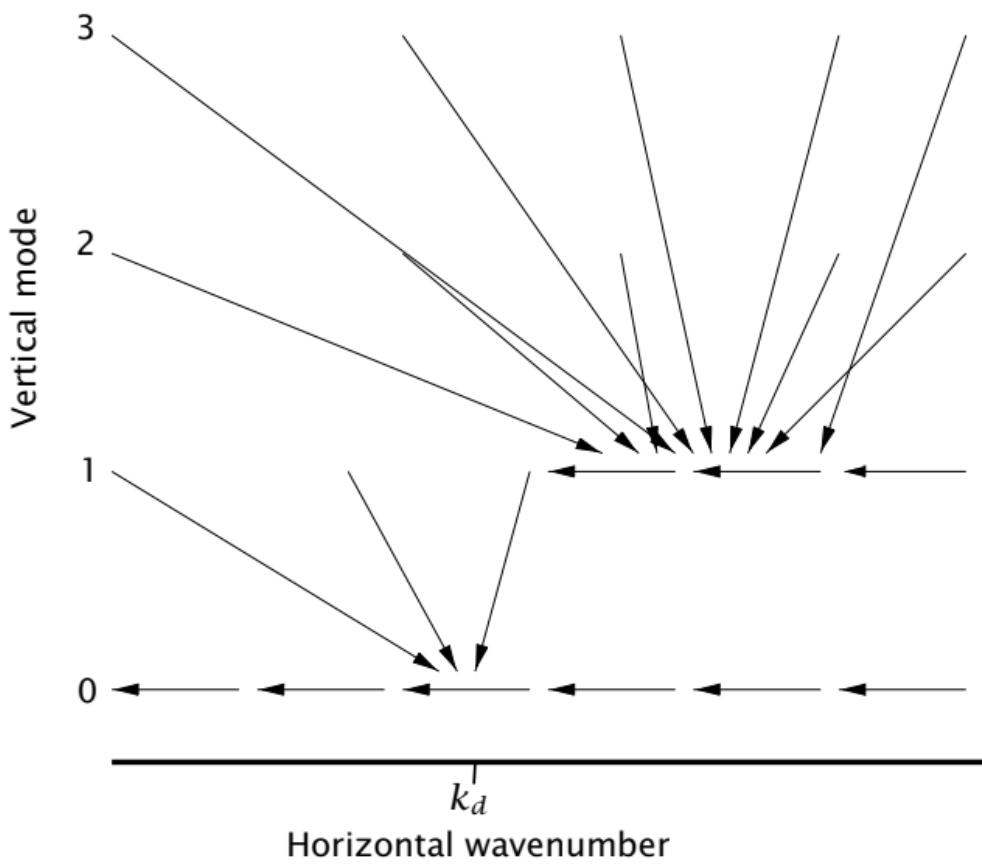


Fig. 12.15

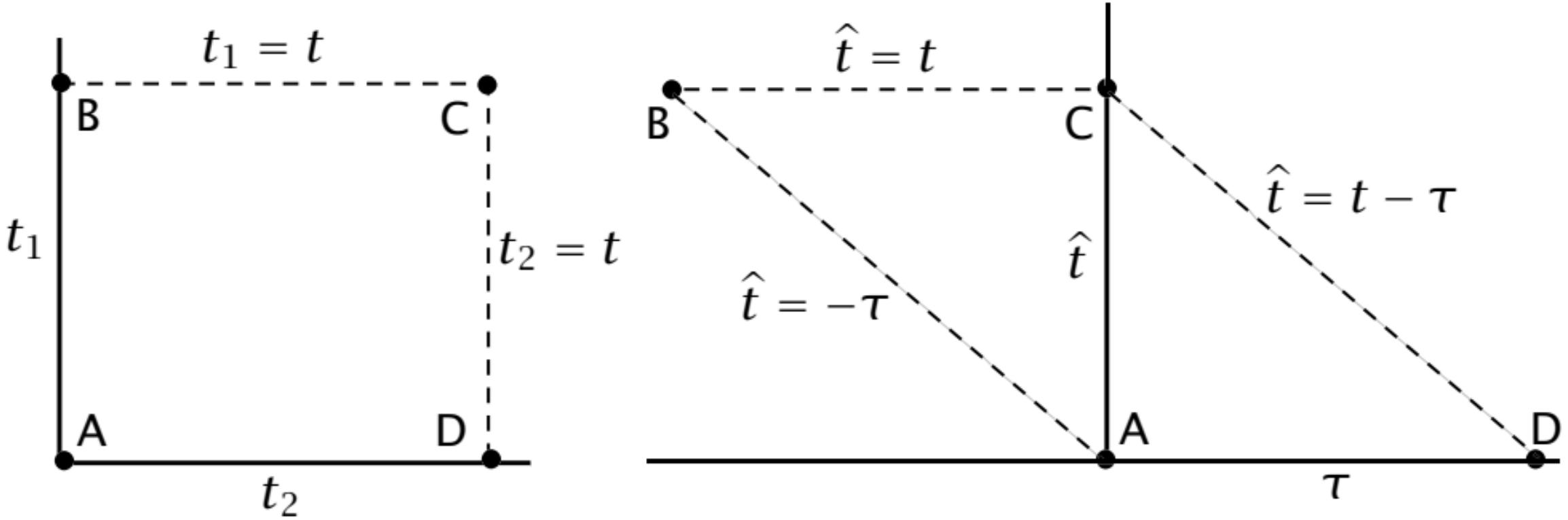


Fig. 13.1

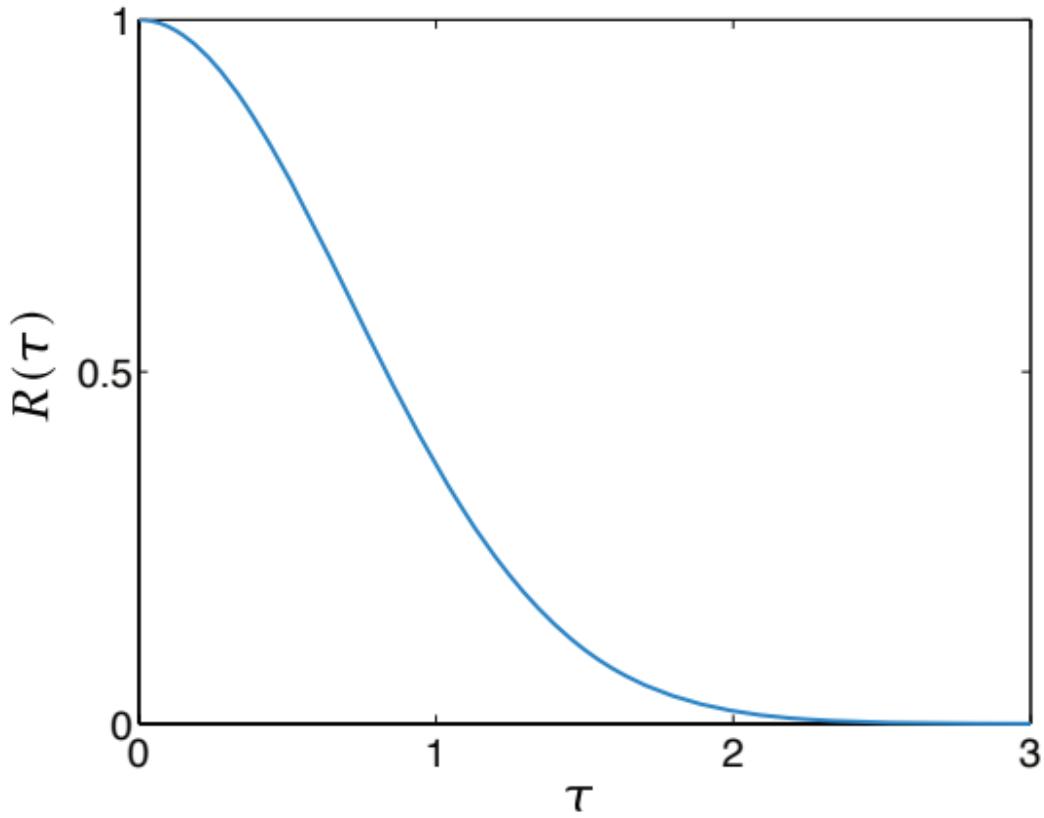


Fig. 13.2

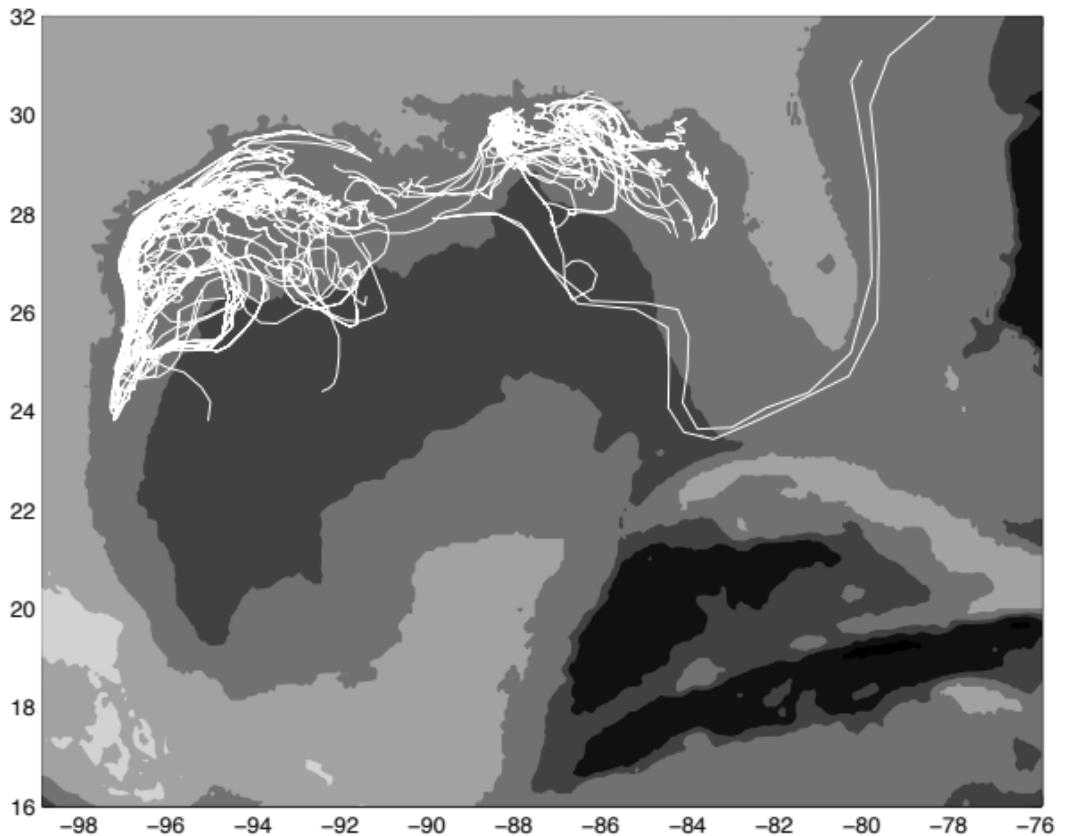


Fig. 13.3

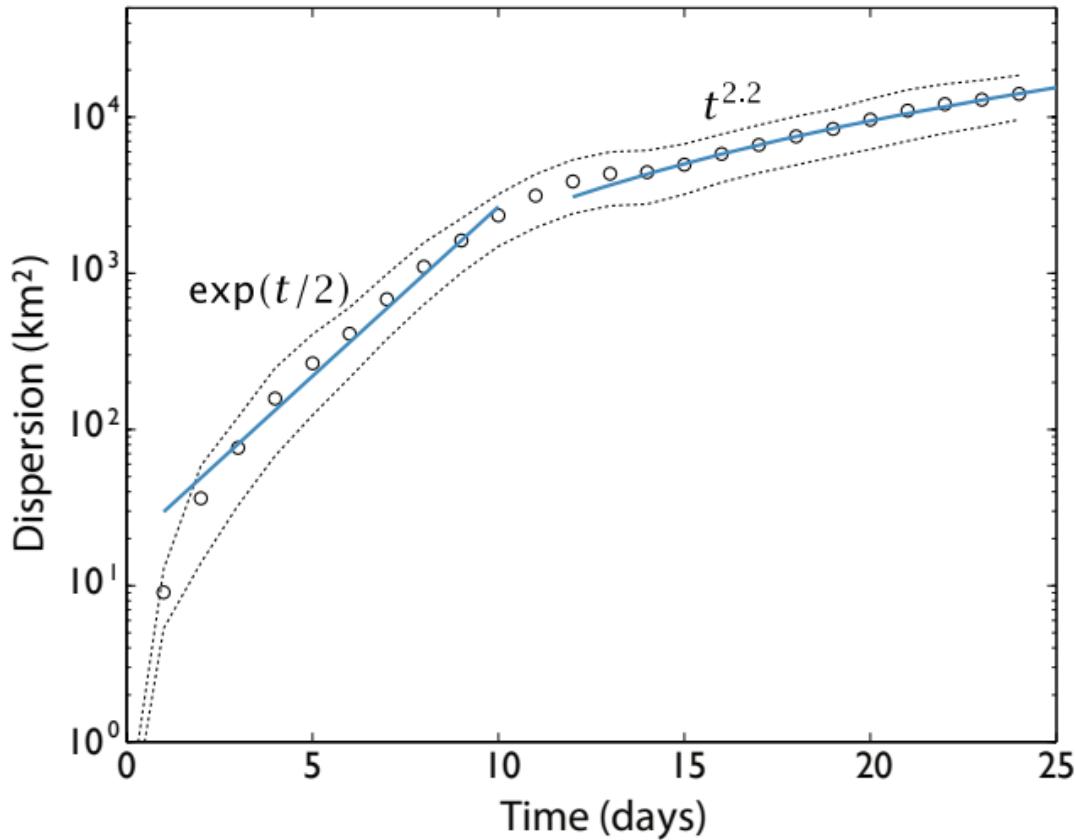


Fig. 13.4

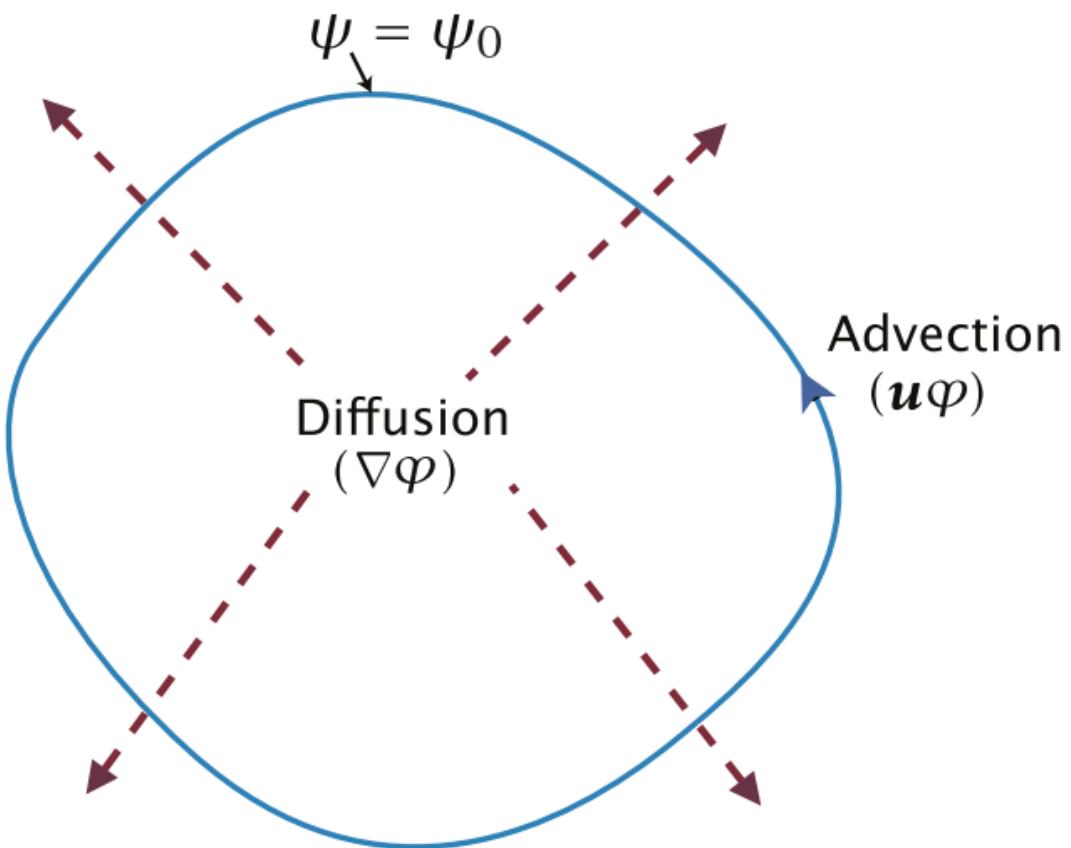


Fig. 13.5

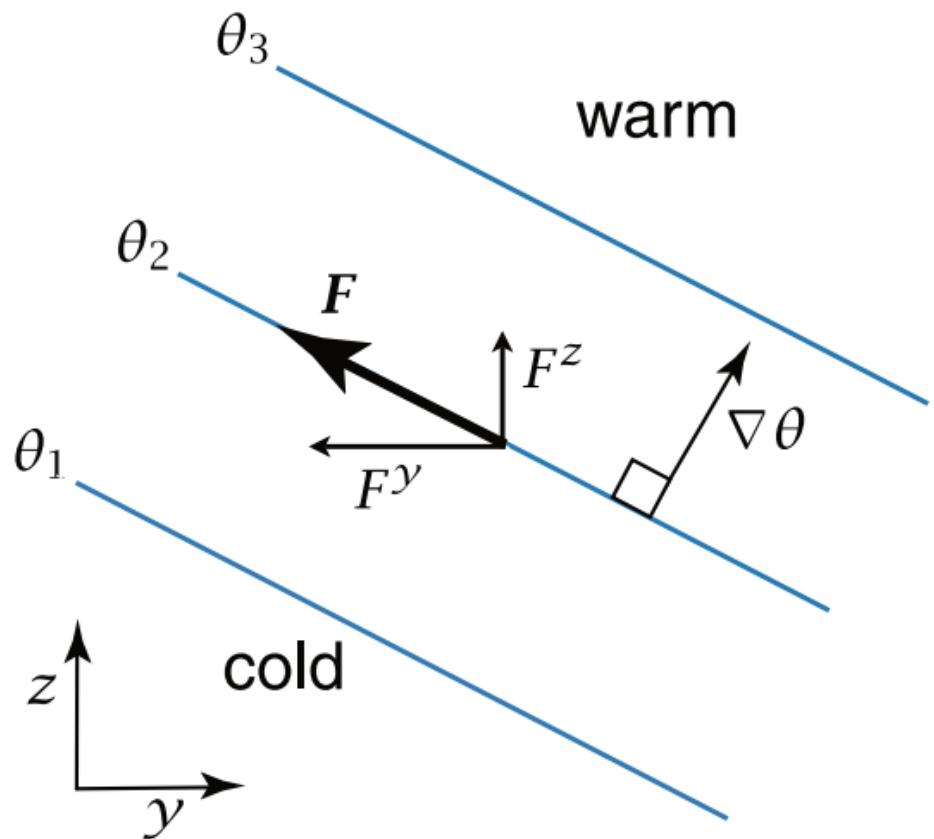


Fig. 13.6

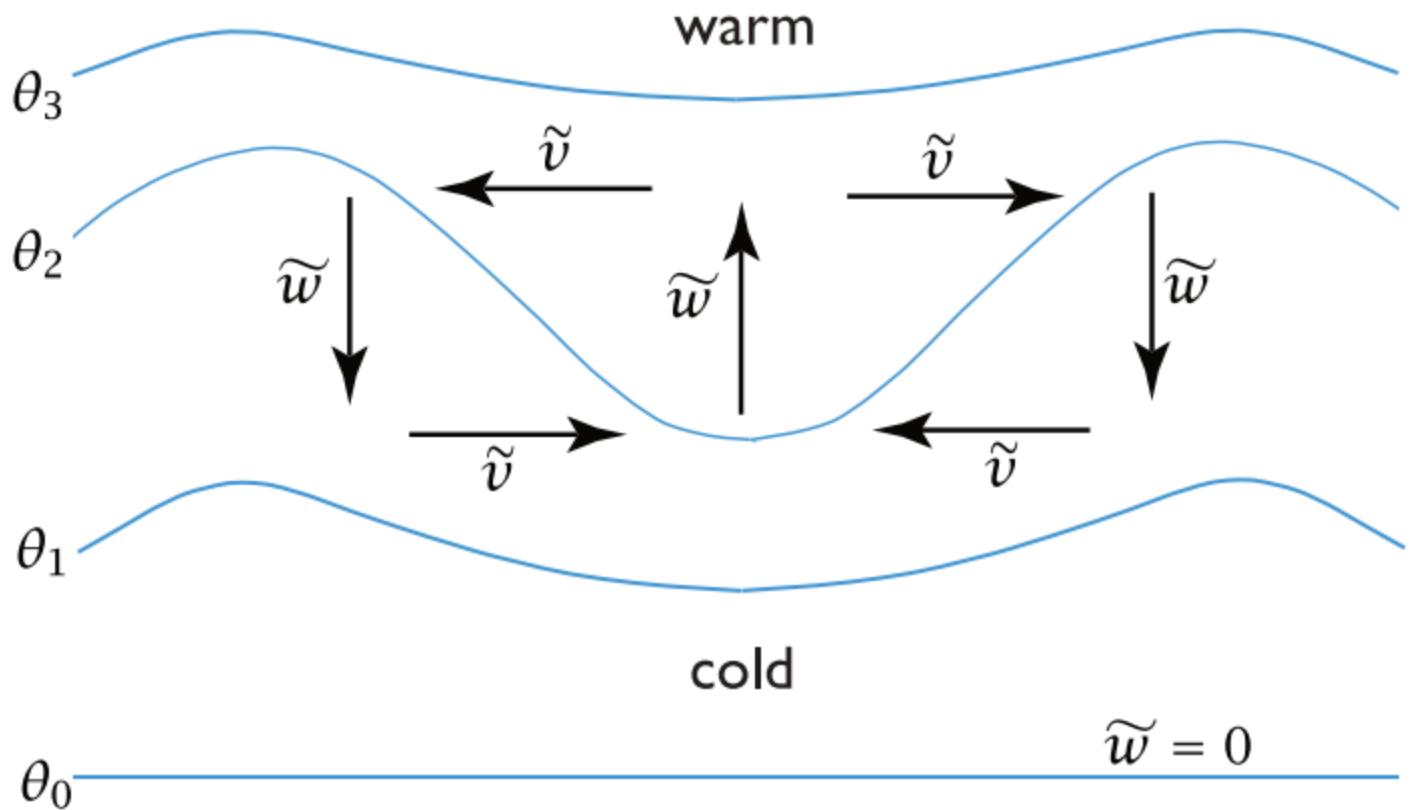


Fig. 13.7

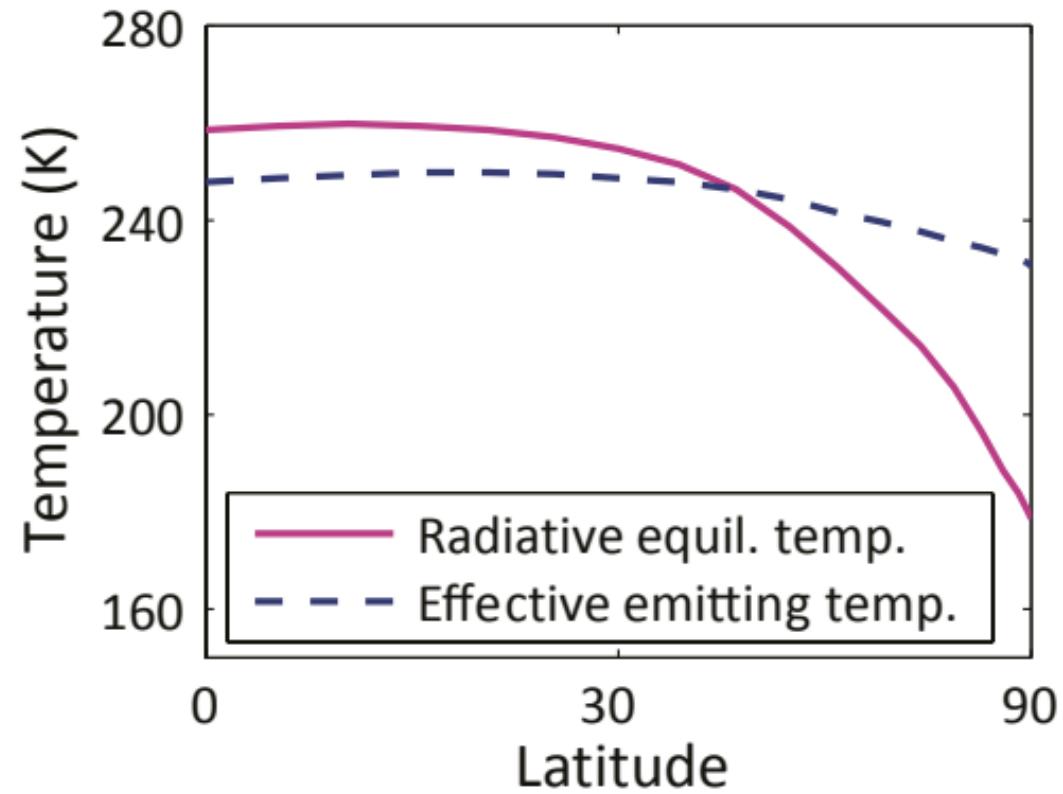
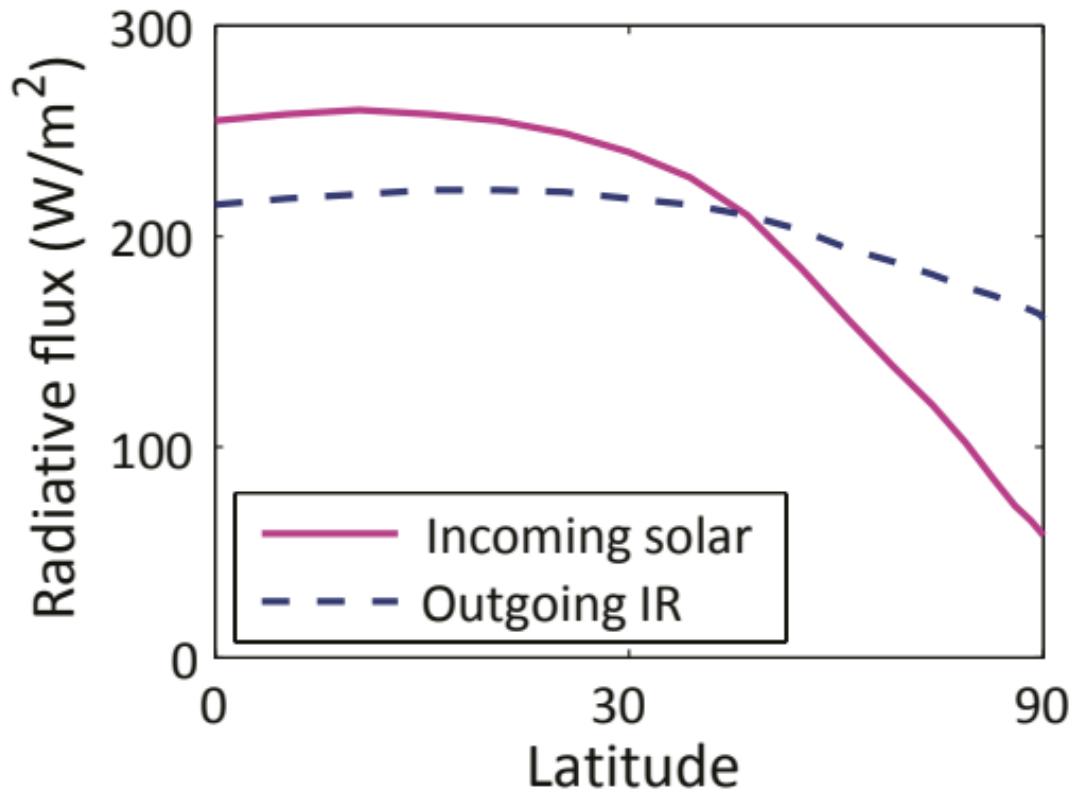


Fig. 14.1

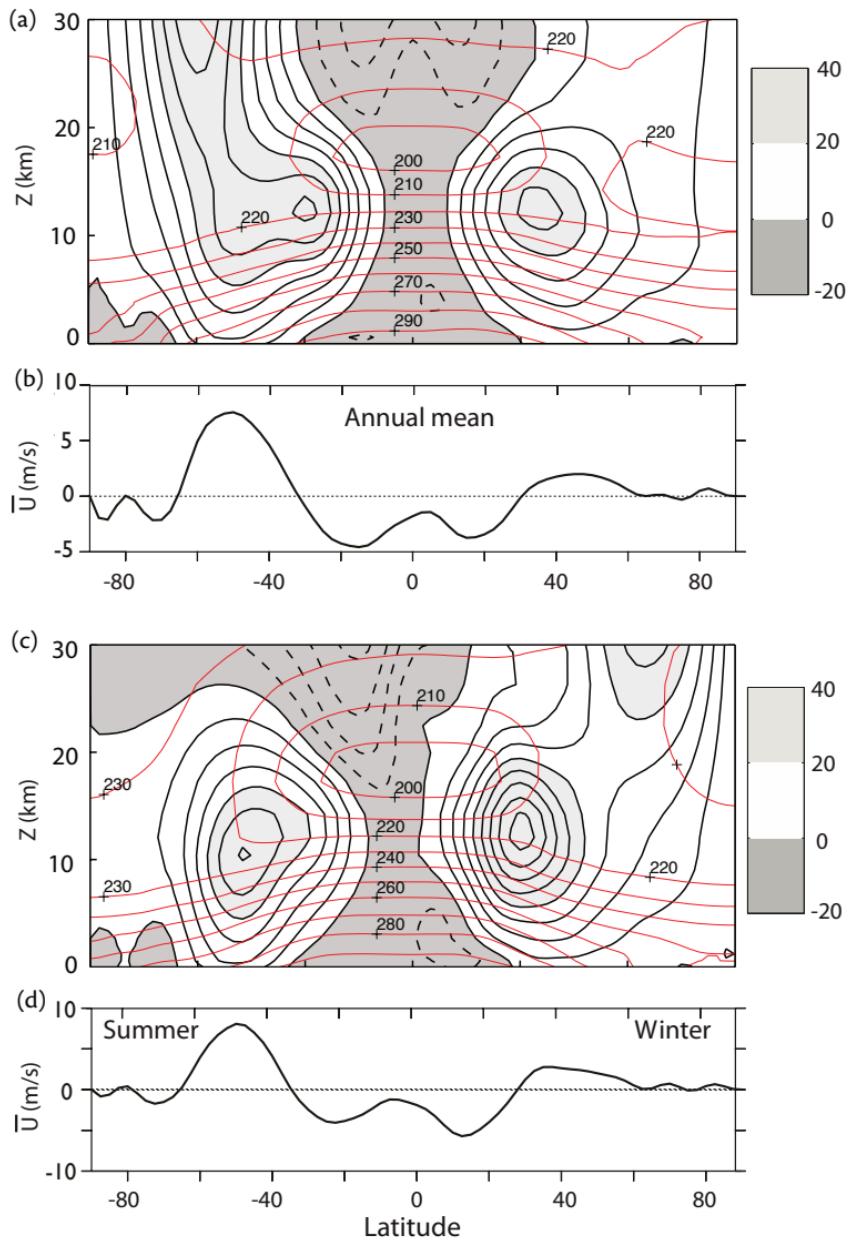


Fig. 14.2

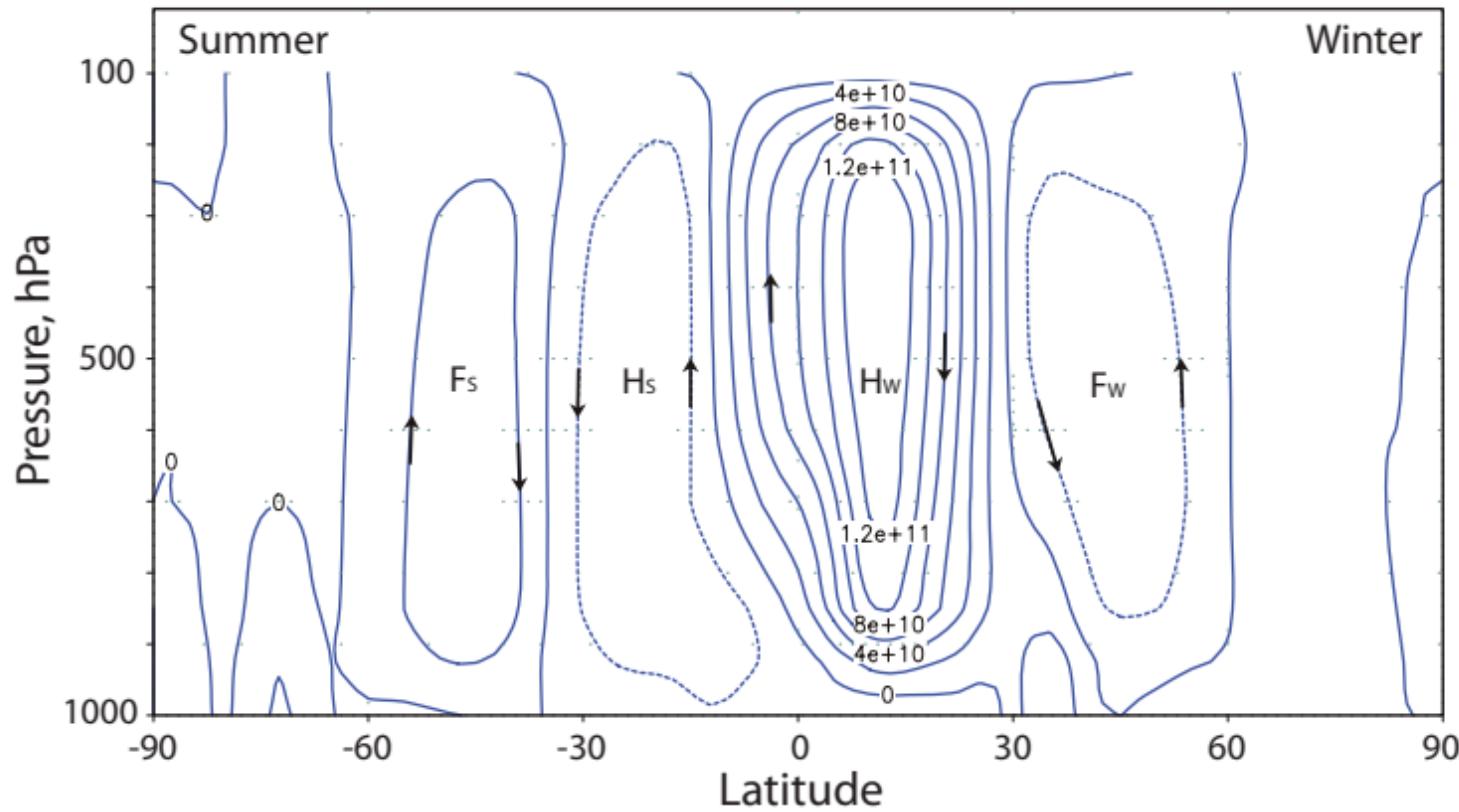


Fig. 14.3

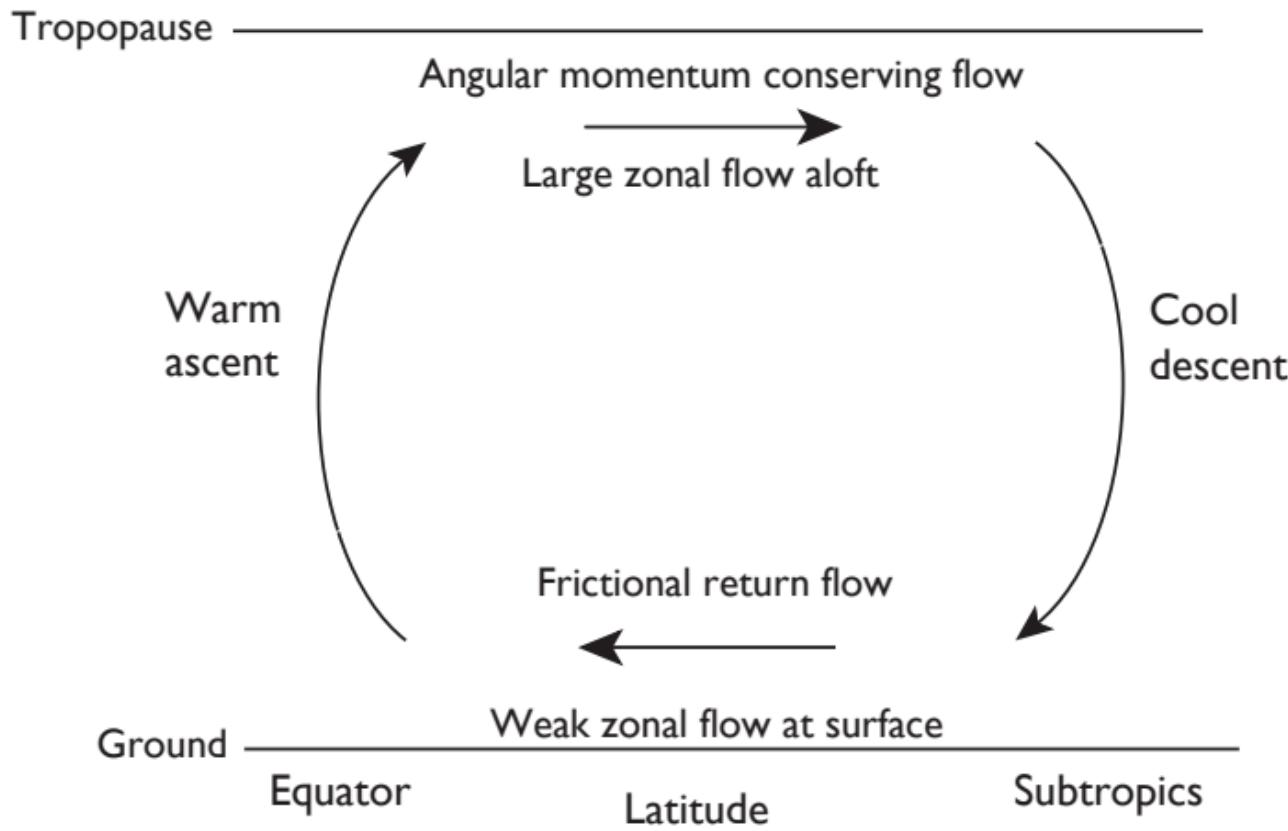


Fig. 14.4

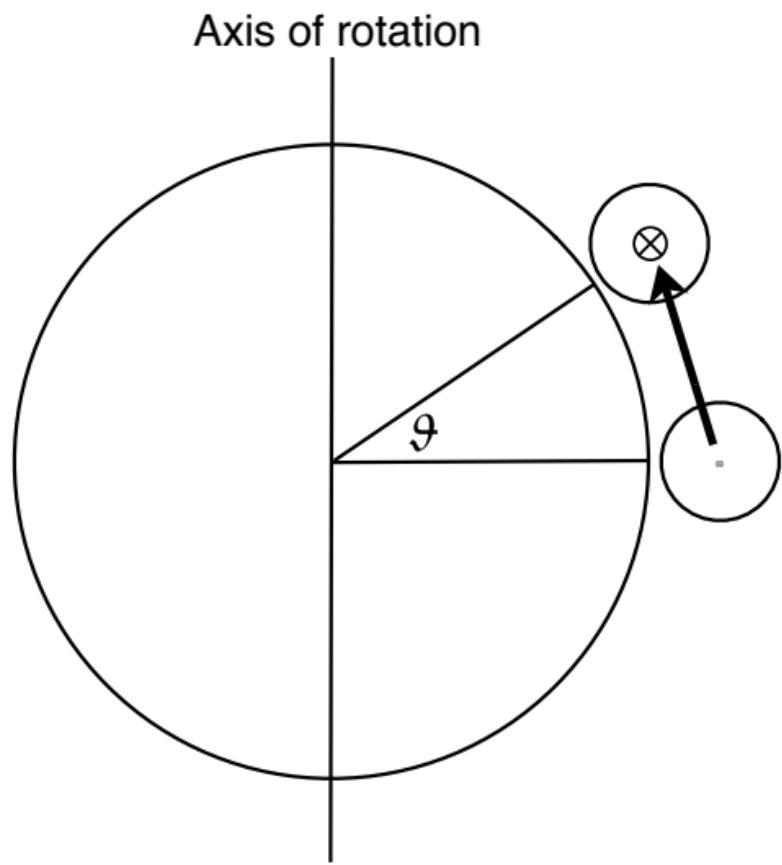


Fig. 14.5

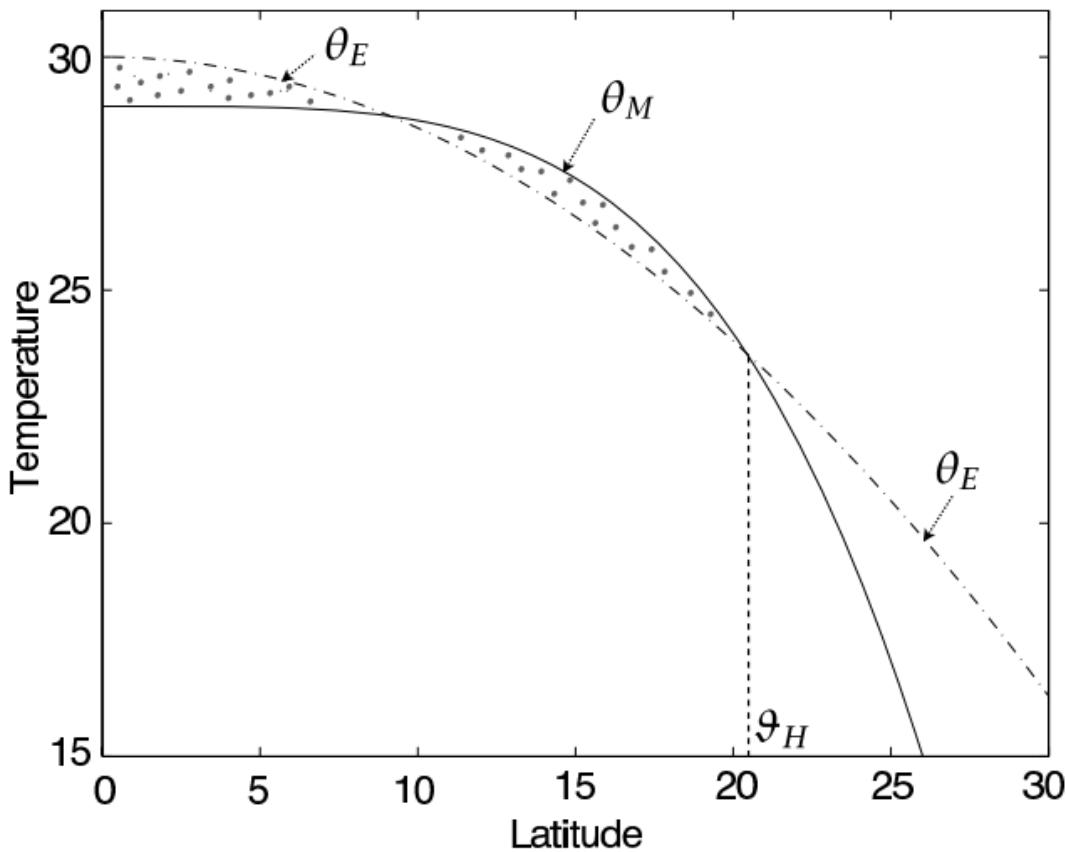


Fig. 14.6

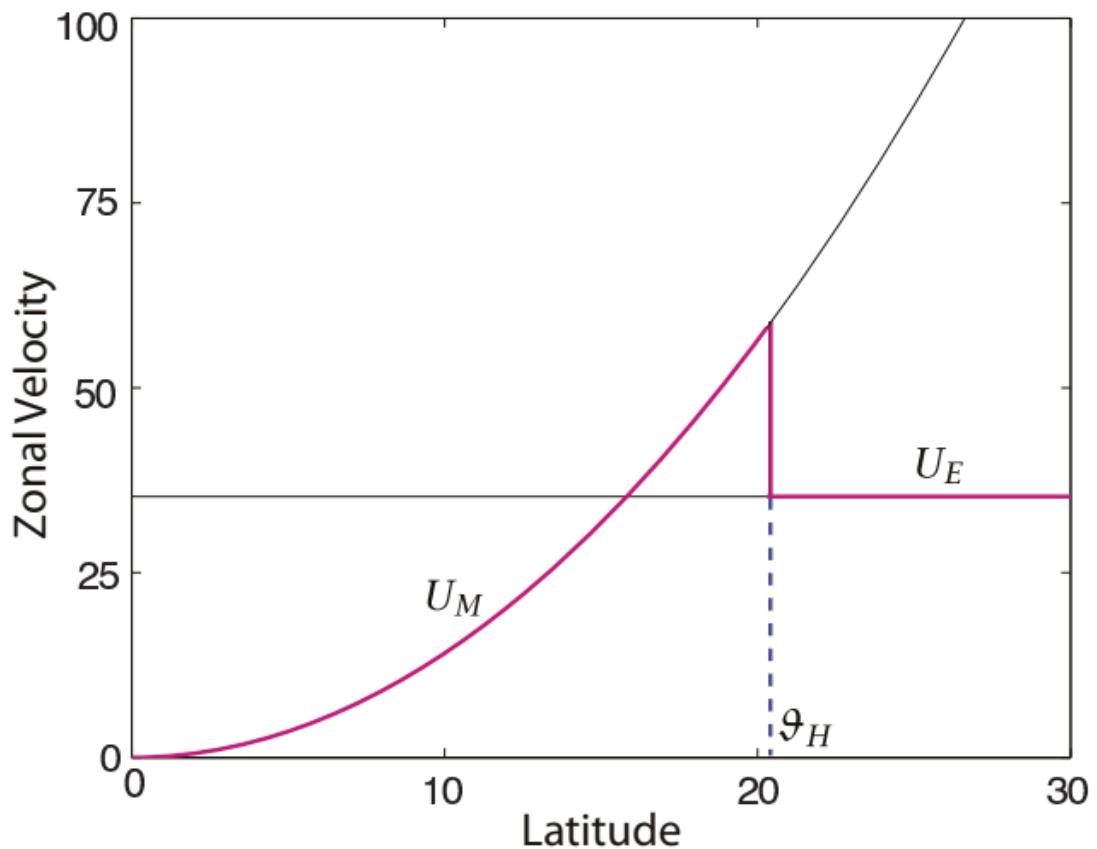


Fig. 14.7

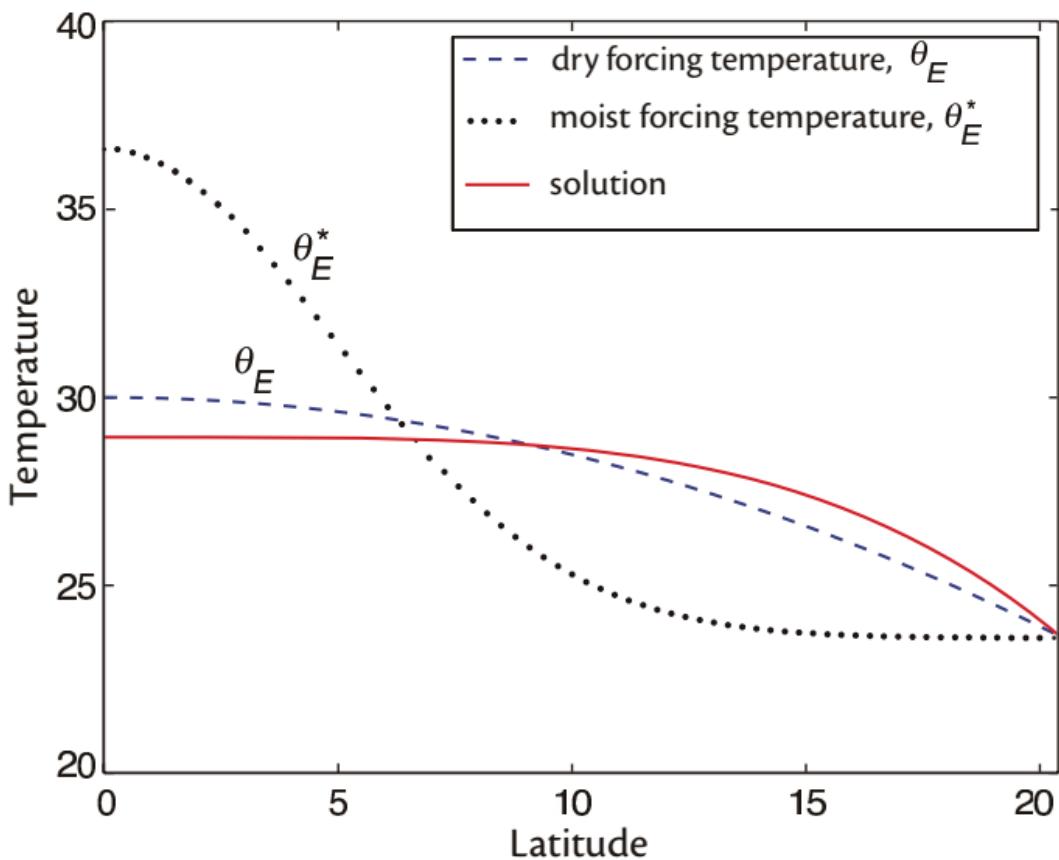


Fig. 14.8

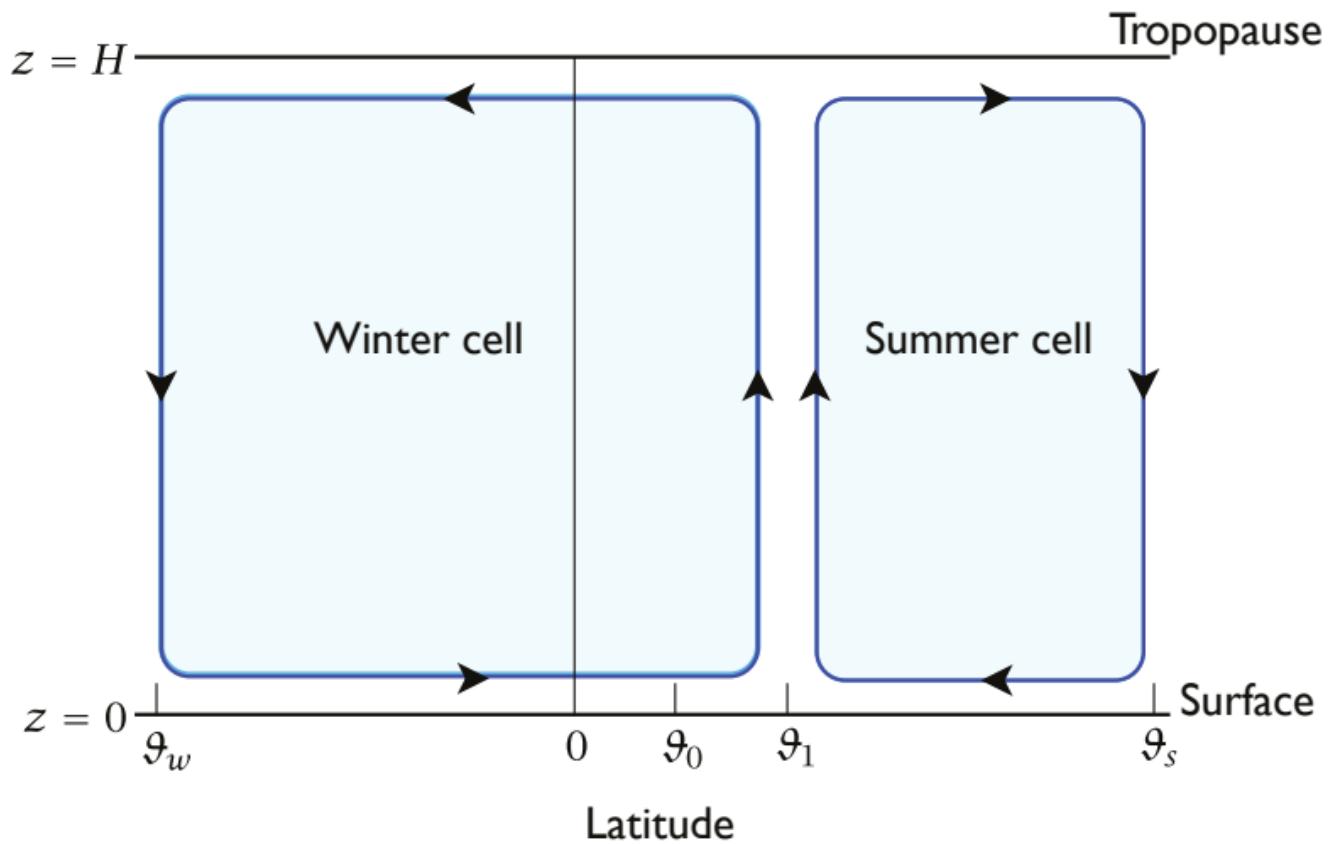


Fig. 14.9

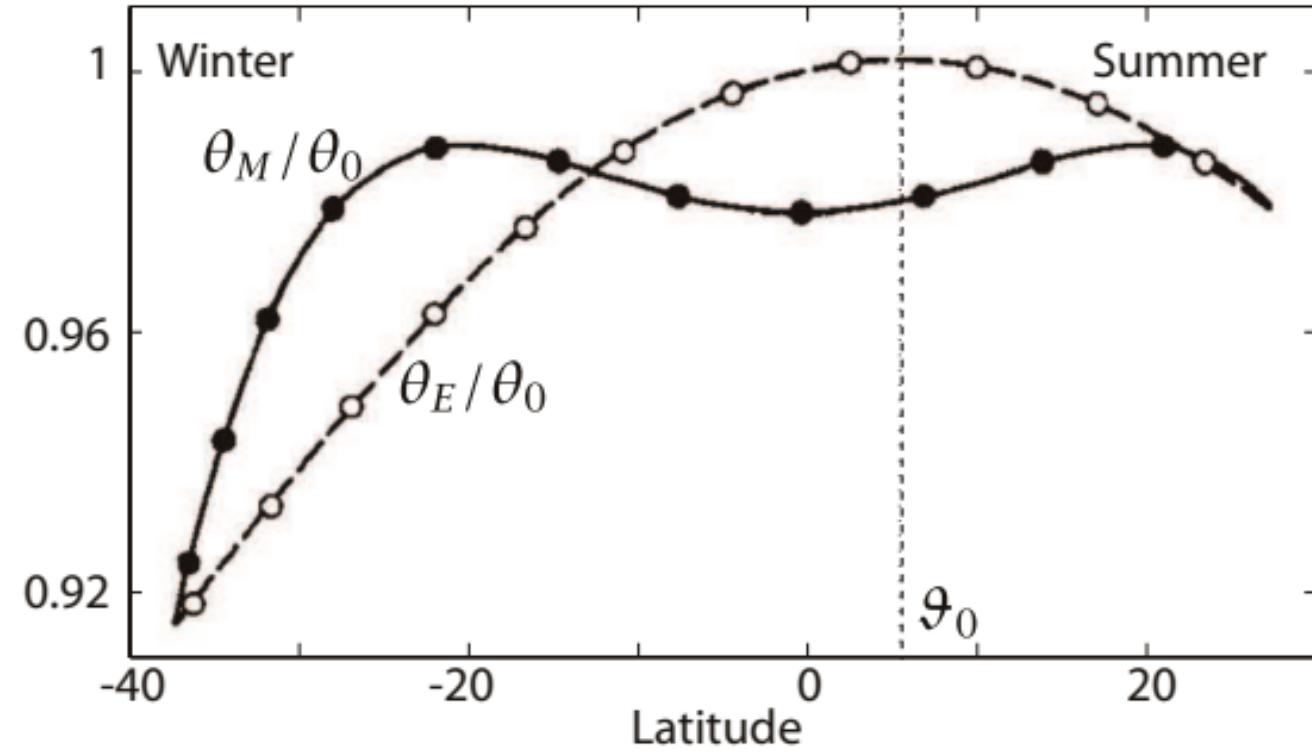
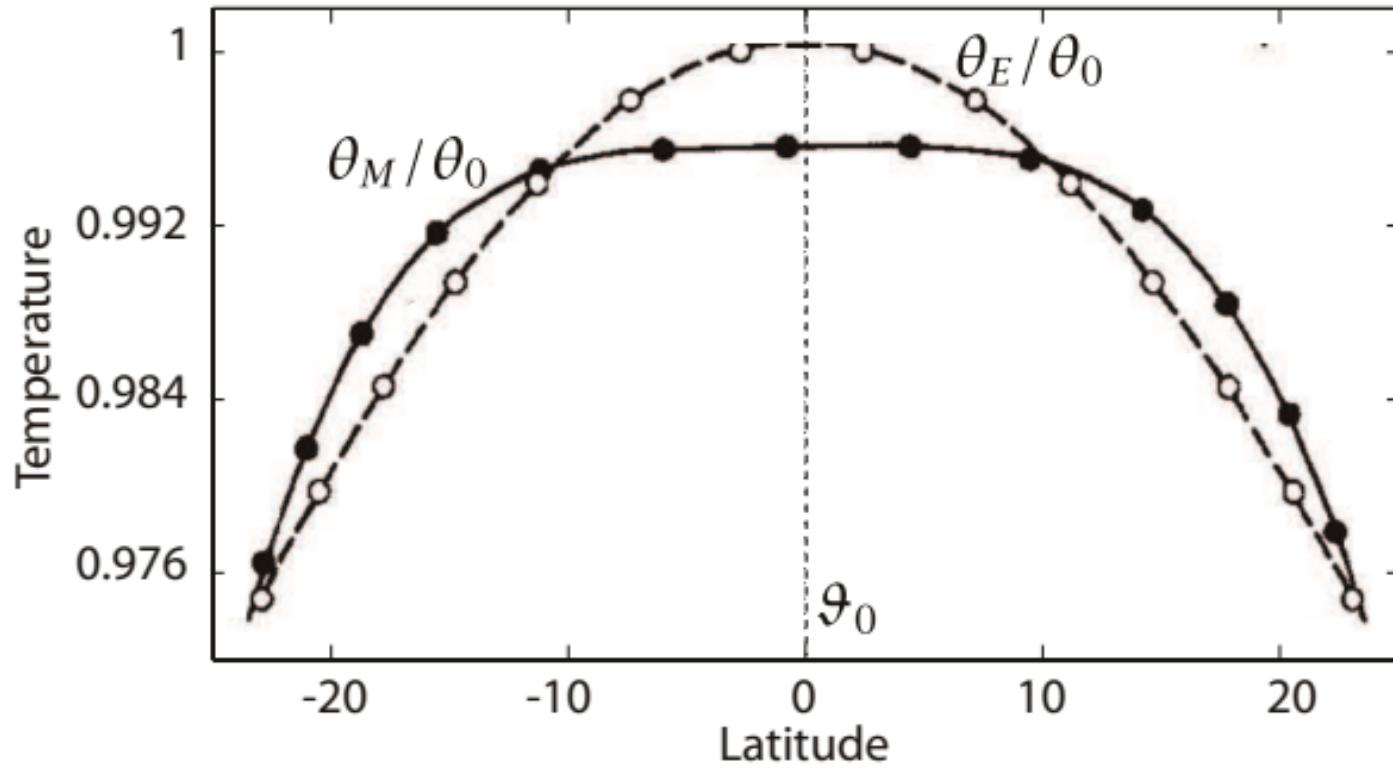


Fig. 14.10

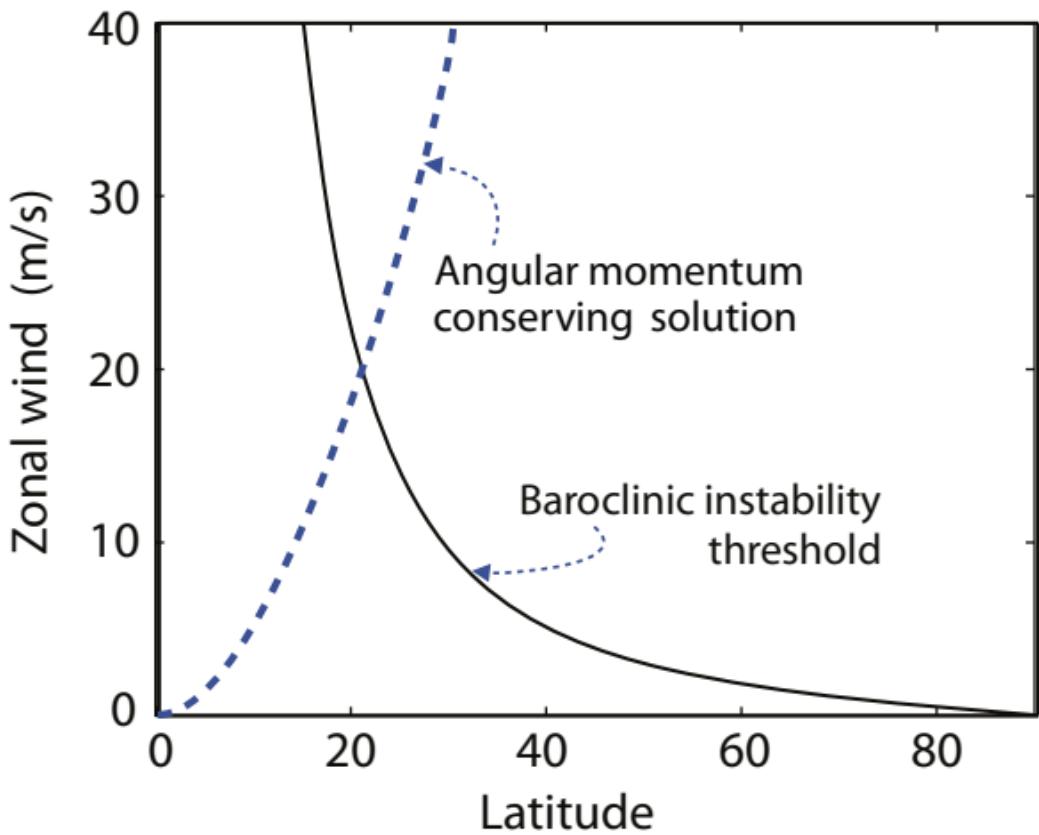


Fig. 14.11

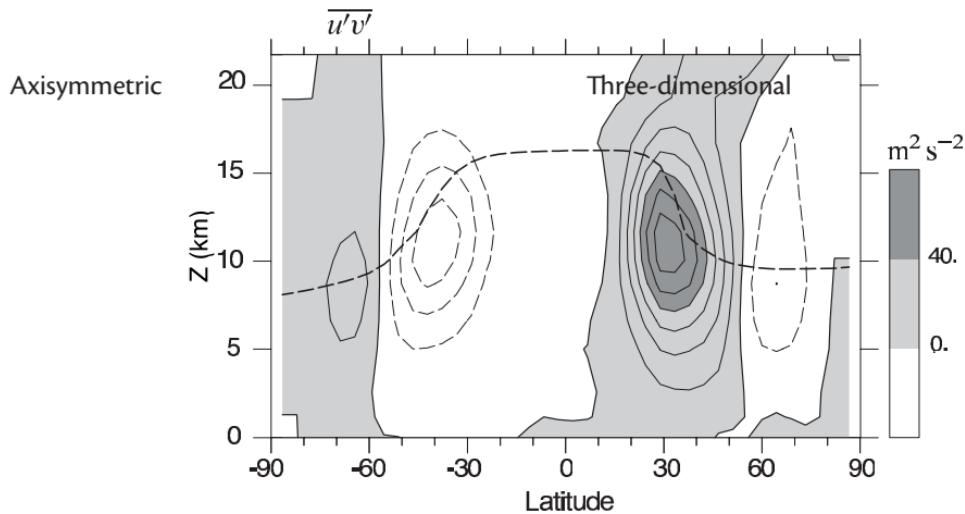
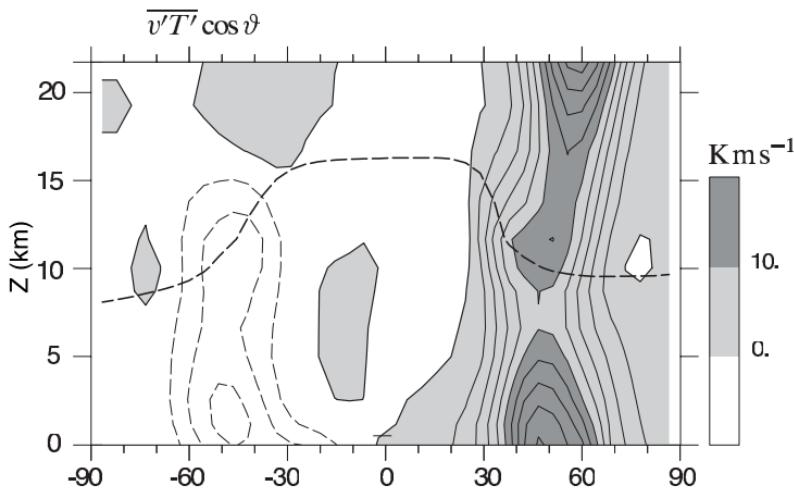


Fig. 14.12

$$\frac{\partial}{\partial y} \overline{u'v'} = 0$$

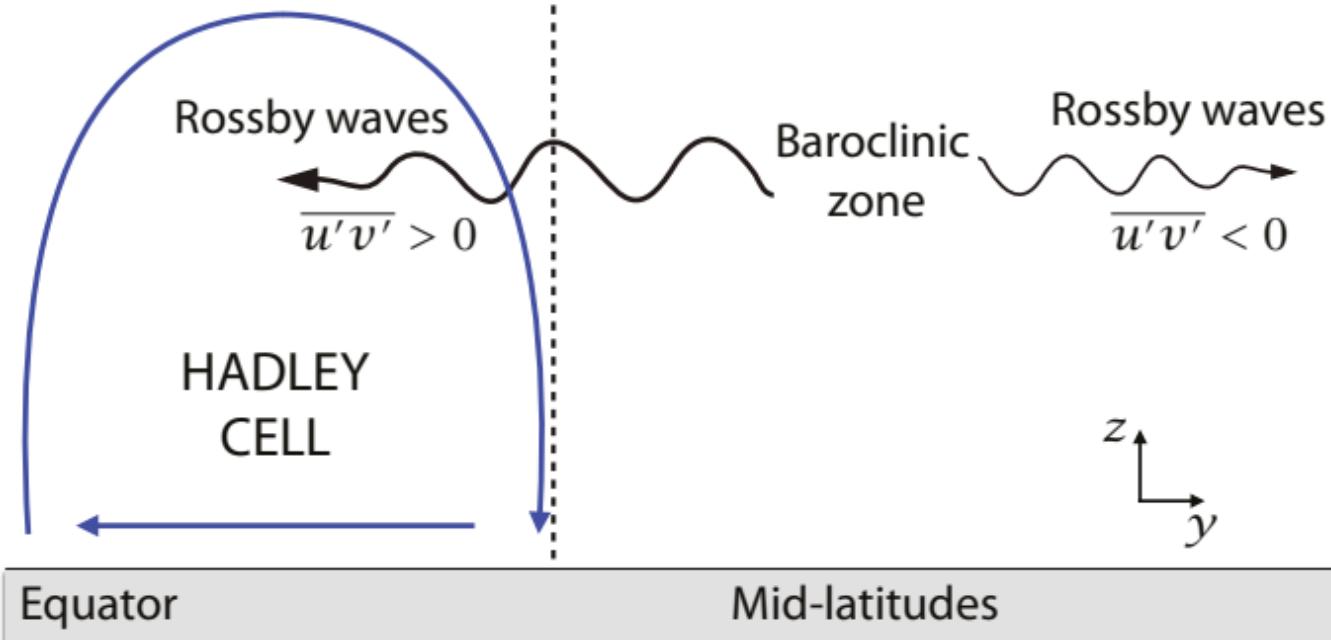


Fig. 14.13

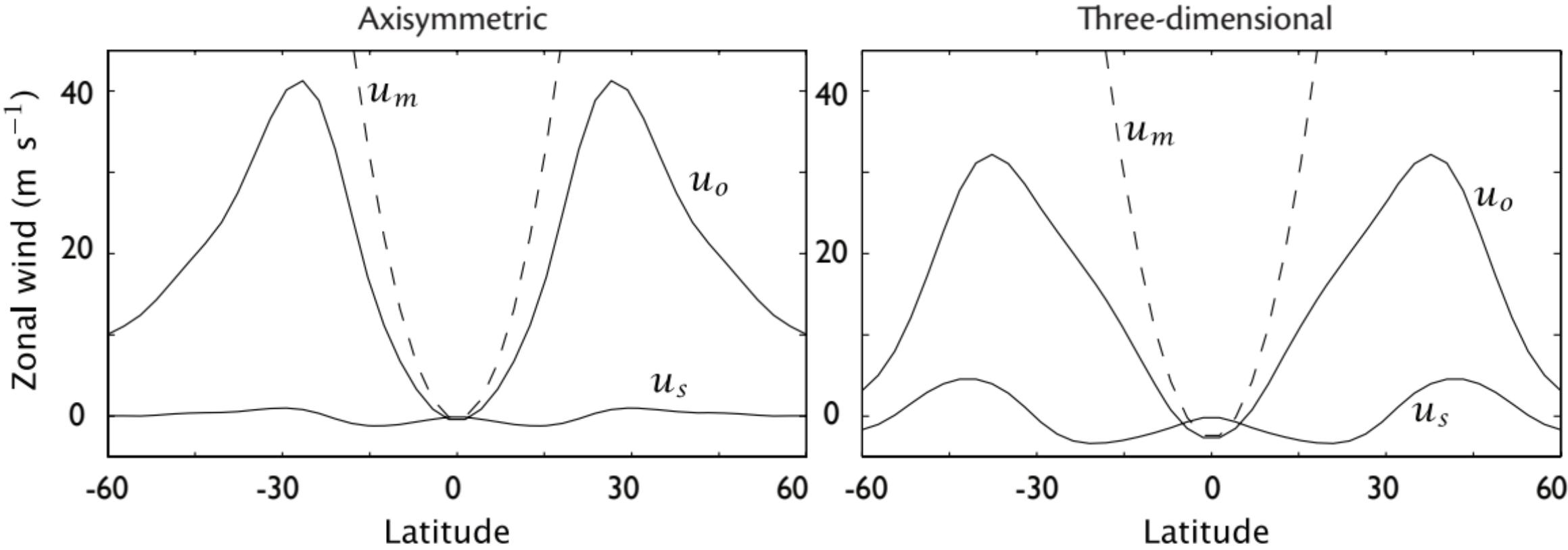


Fig. 14.14

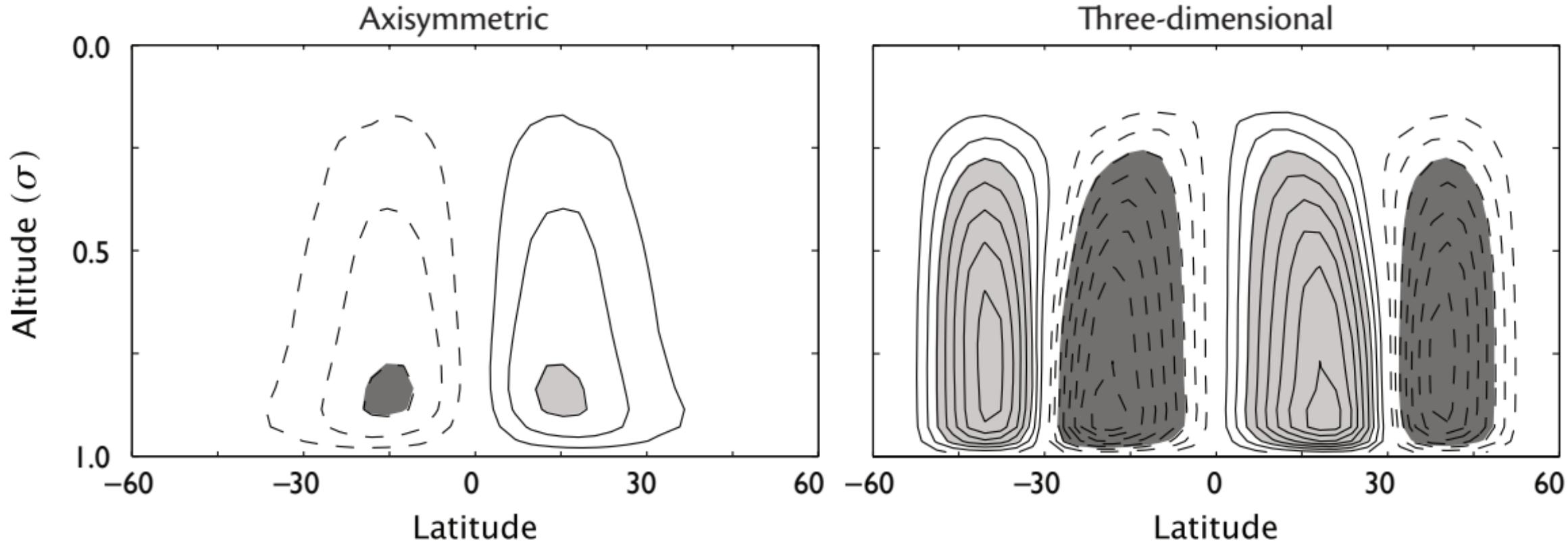


Fig. 14.15

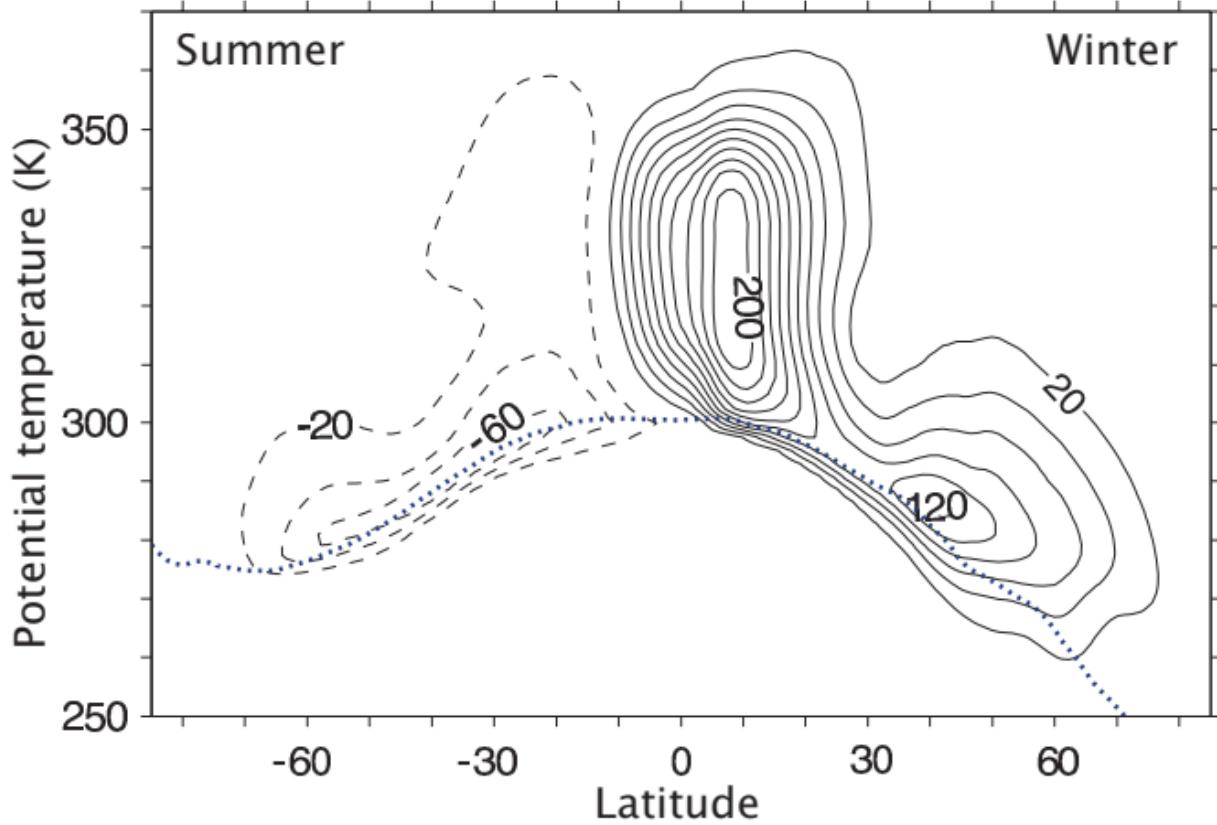


Fig. 14.16

Tropopause

$$fv \sim \frac{\partial \overline{u'v'}}{\partial y} < 0$$

$$w \sim -\frac{\partial \overline{v'\theta'}}{\partial y} < 0$$

$$w \sim -\frac{\partial \overline{v'\theta'}}{\partial y} > 0$$

Subtropics

Subpolar
regions

Ground

$$fv \sim r \bar{u}_{surf} > 0$$

Latitude

Boundary
layer

Fig. 14.17

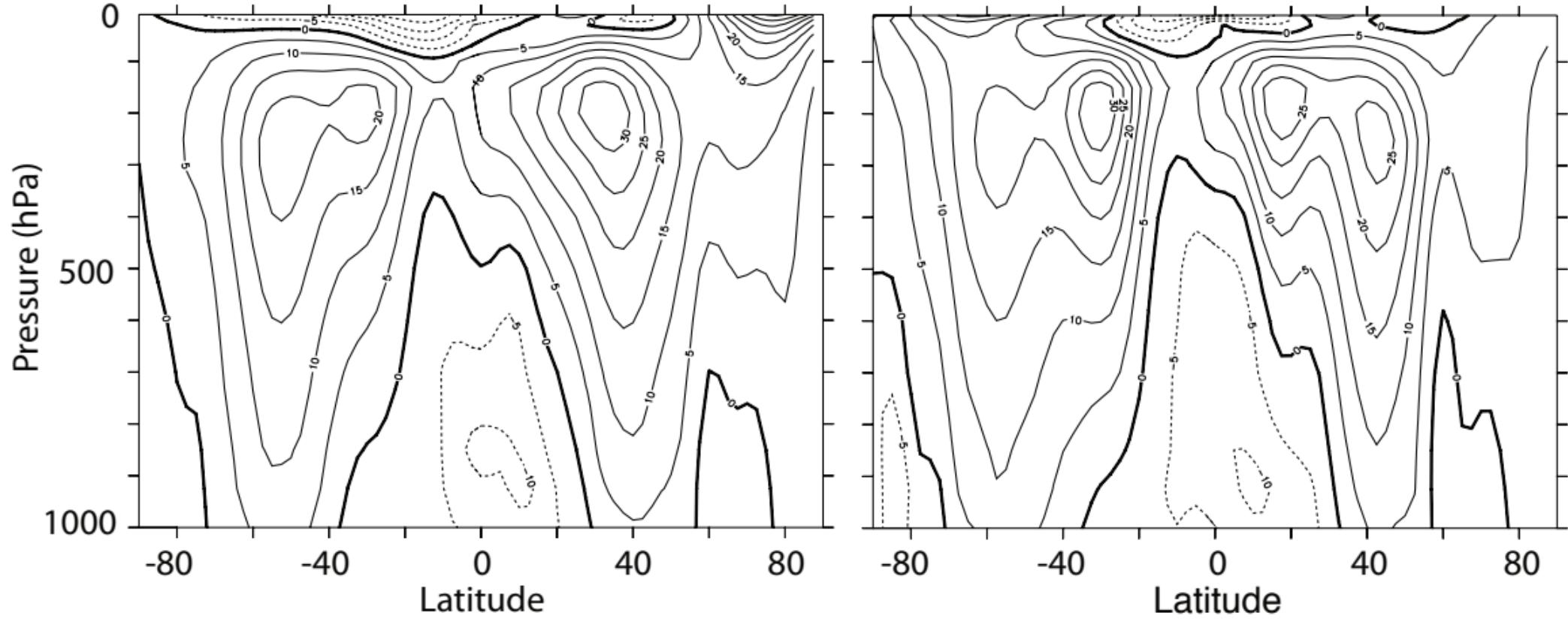


Fig. 15.1

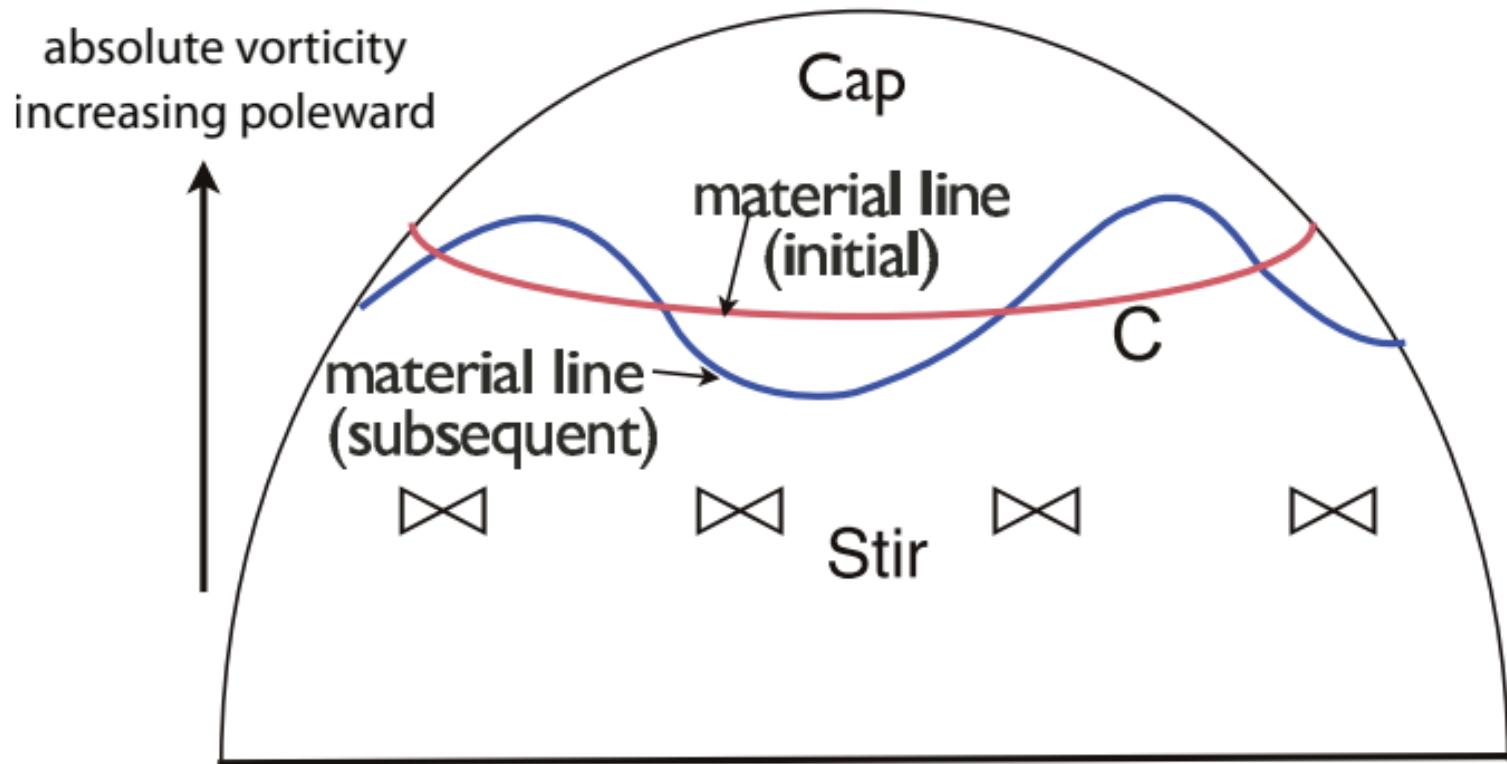


Fig. 15.2

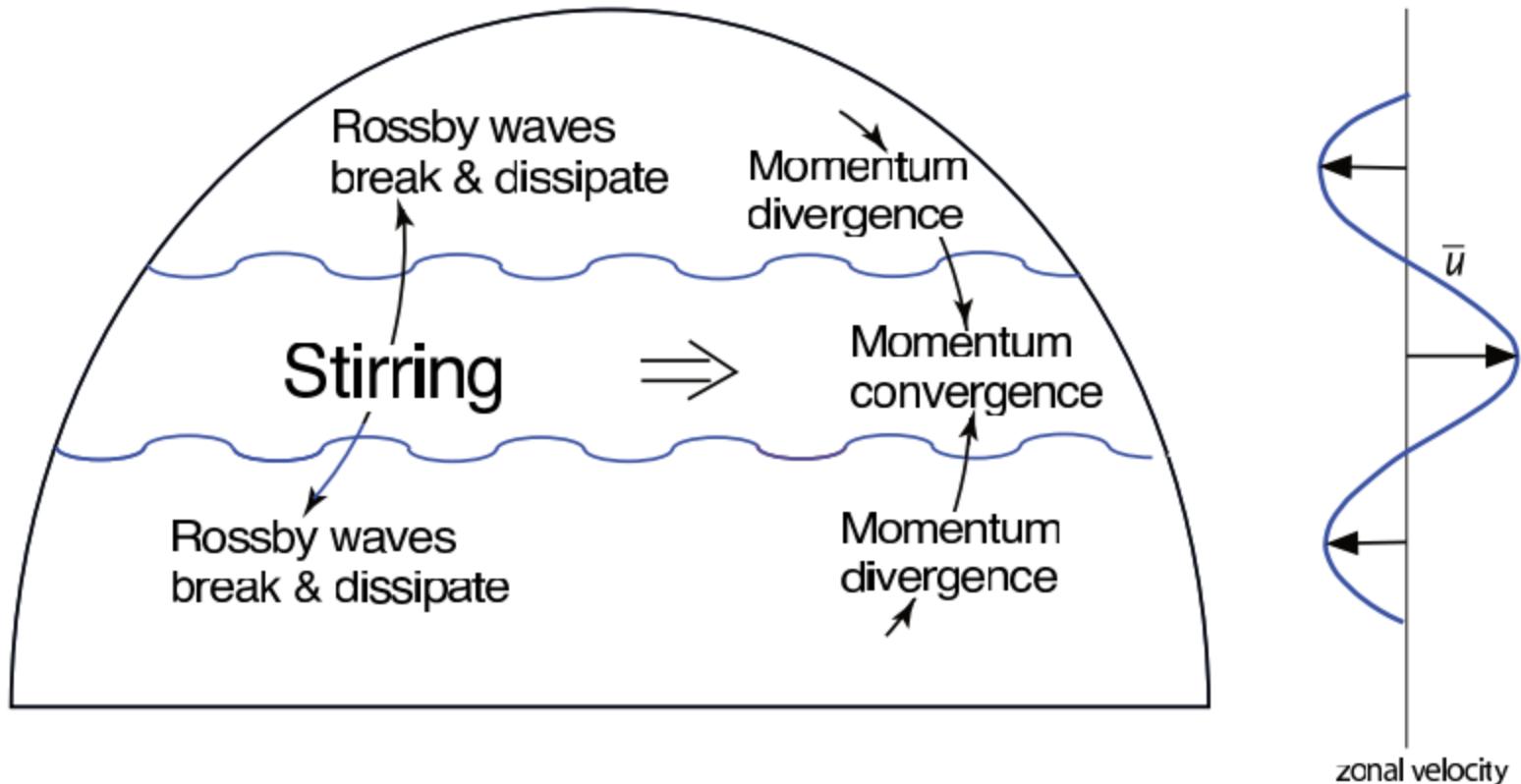


Fig. 15.3

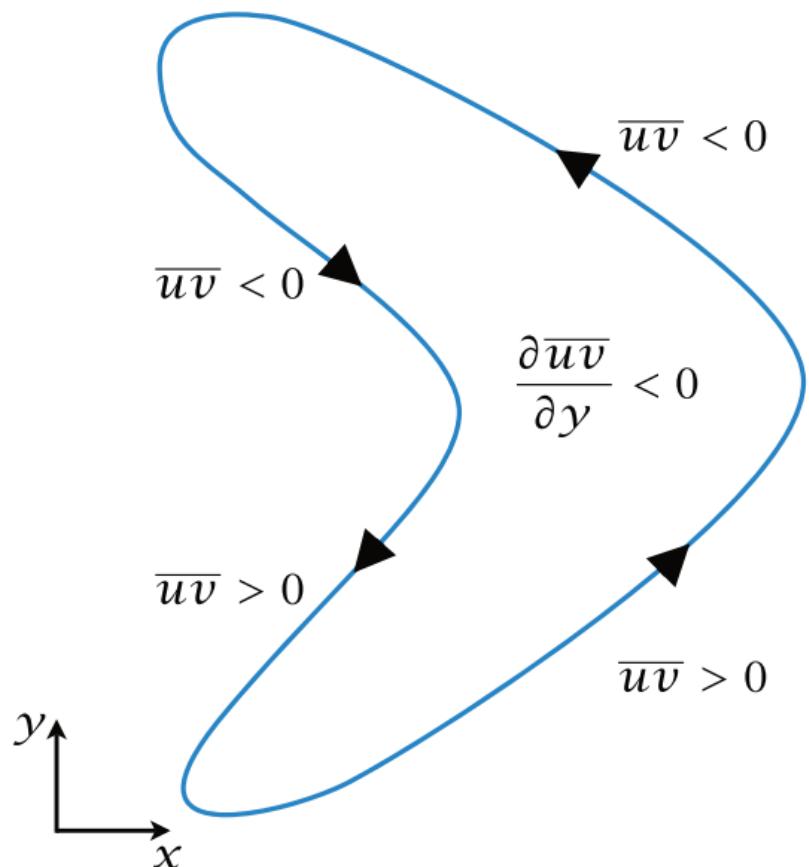


Fig. 15.4

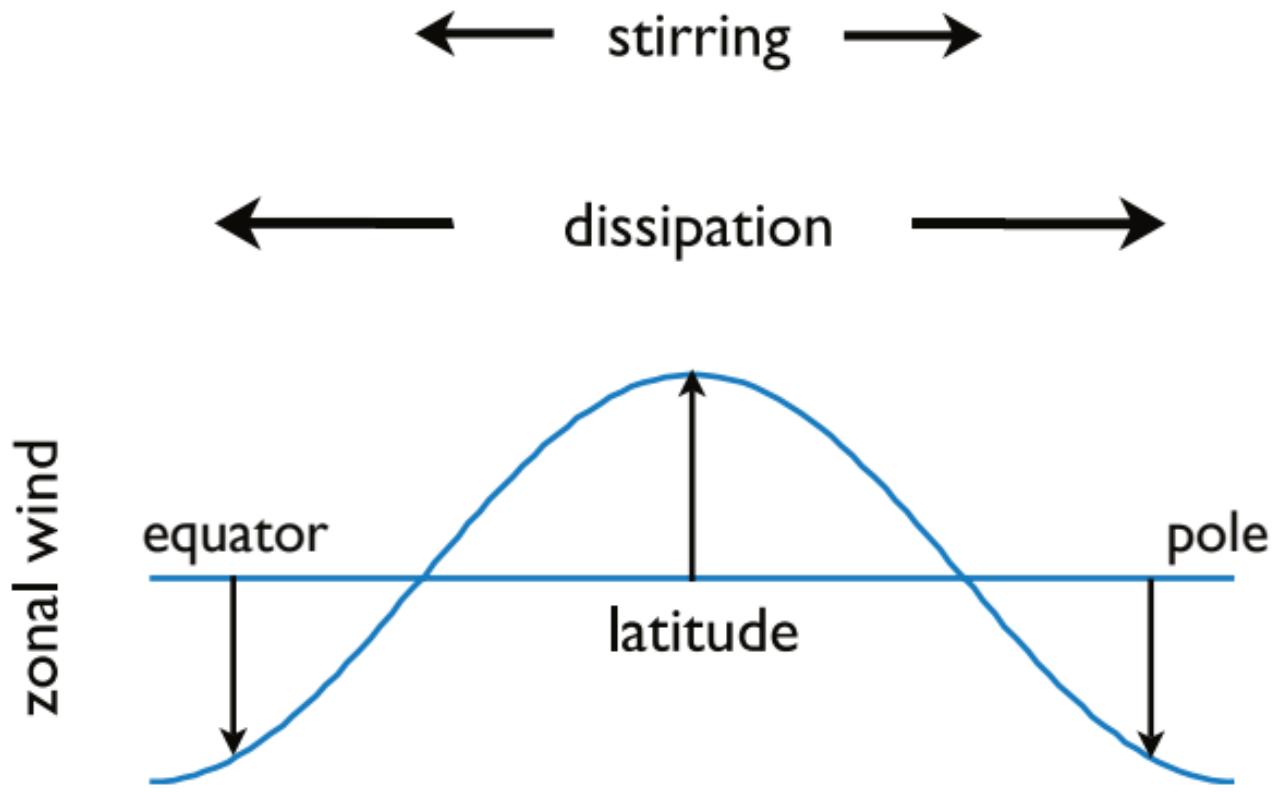


Fig. 15.5

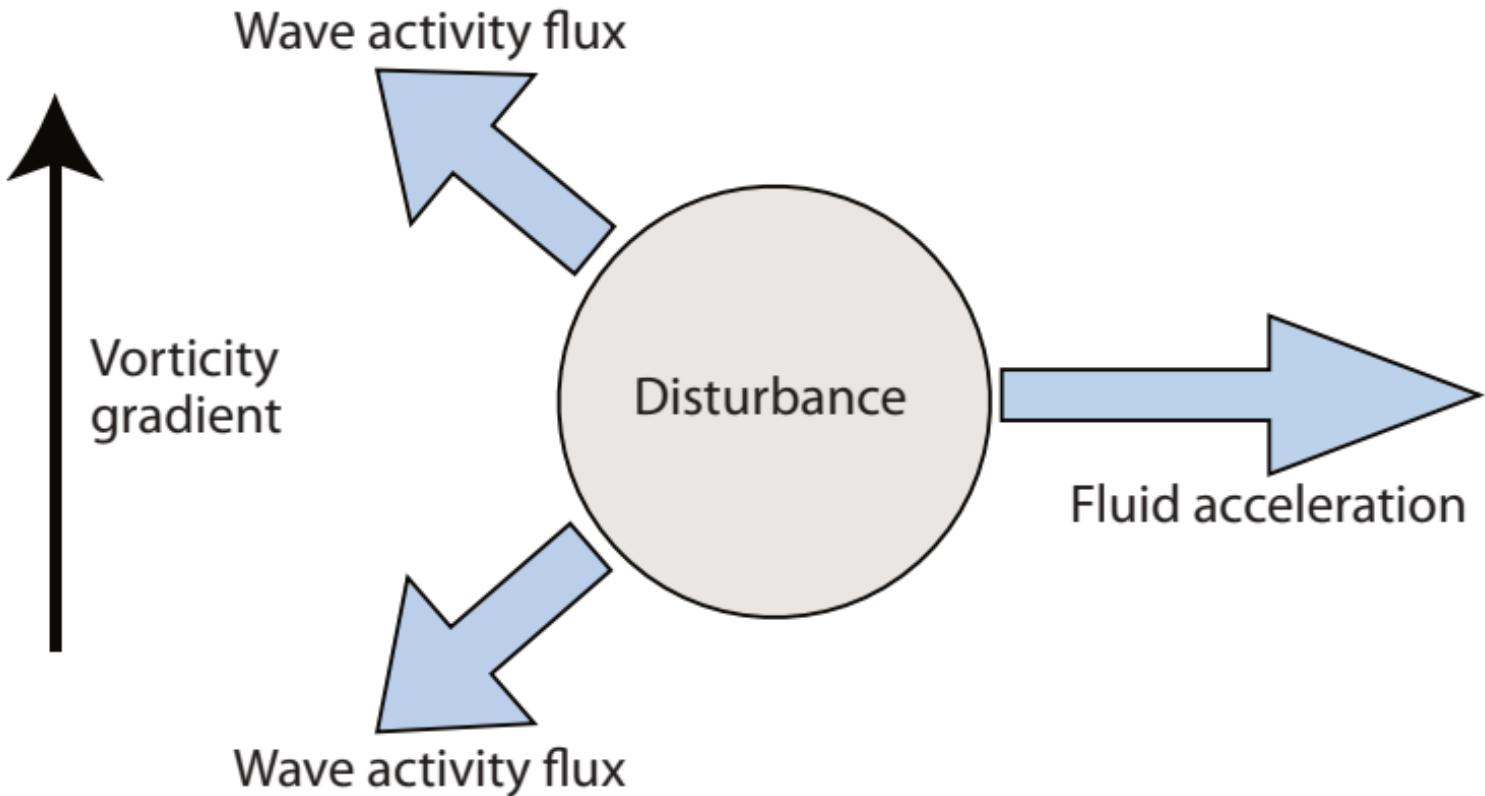


Fig. 15.6

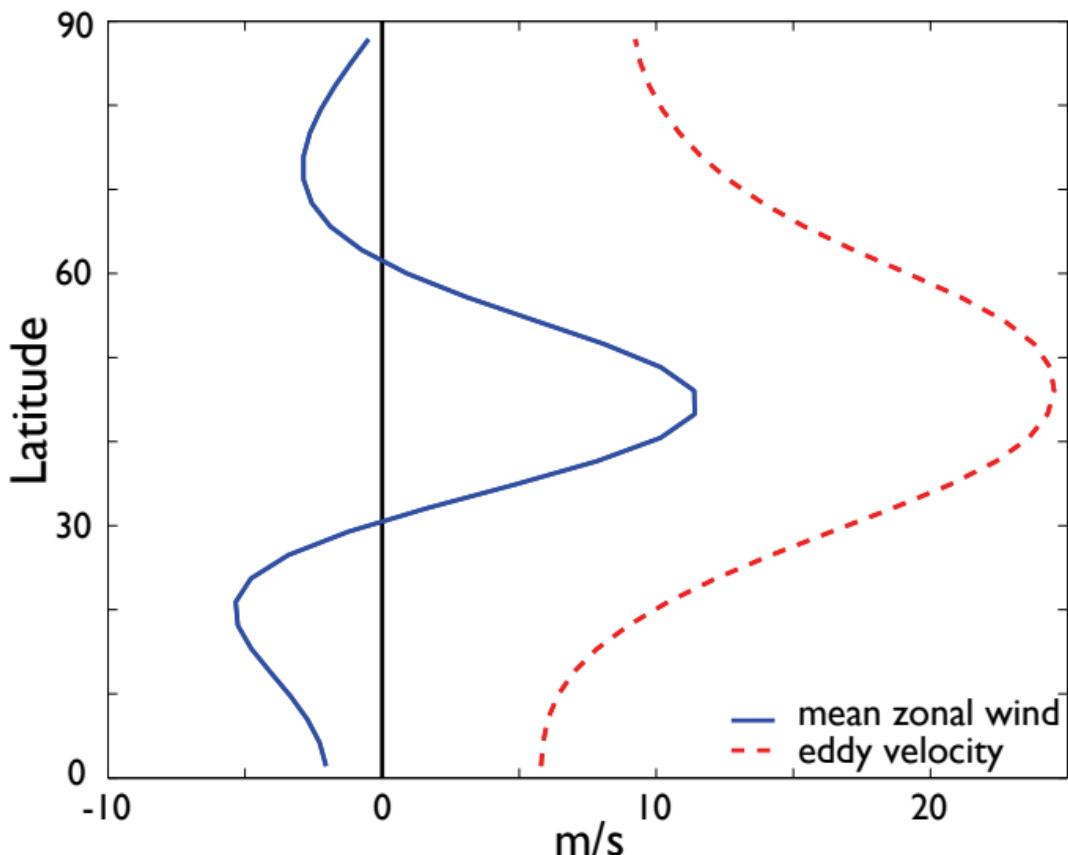


Fig. 15.7

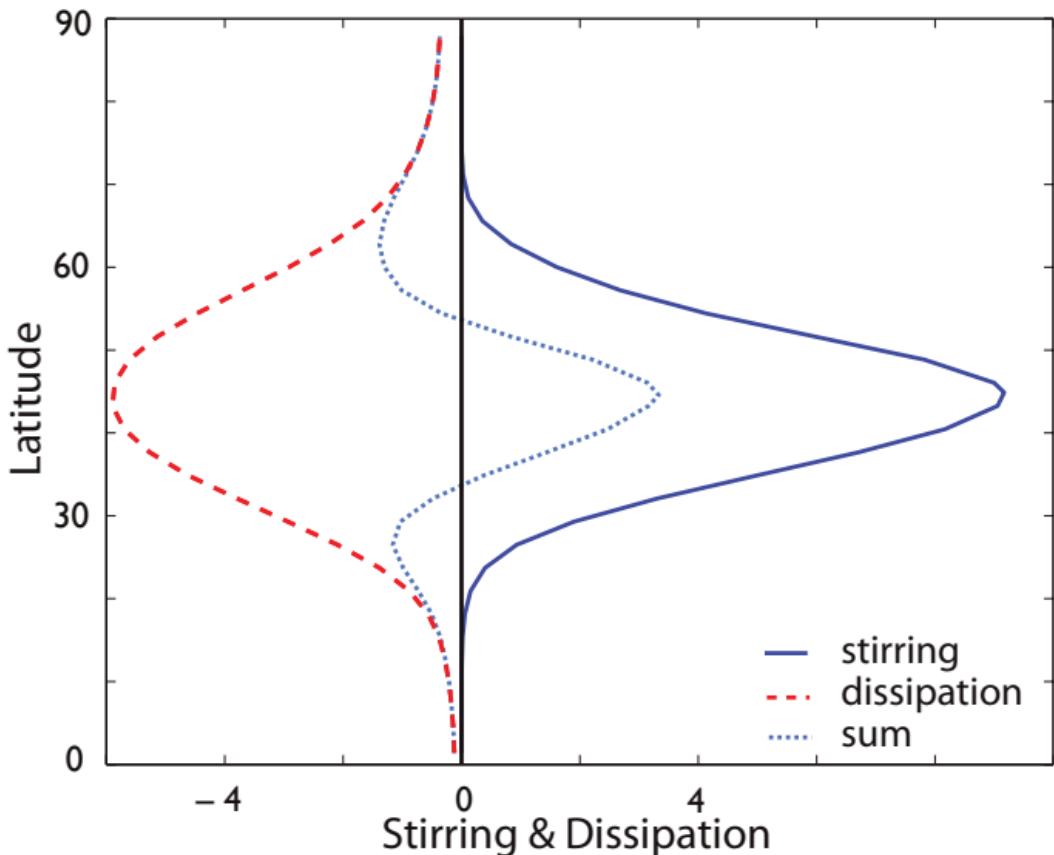


Fig. 15.8

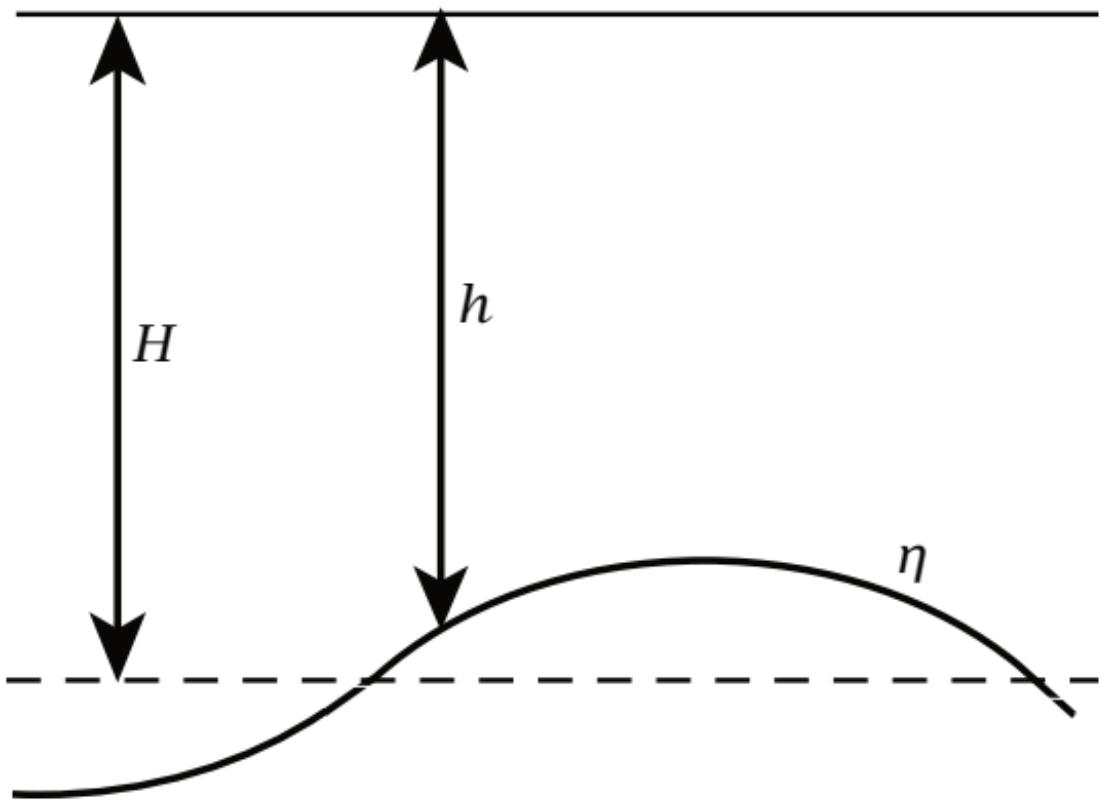


Fig. 15.9

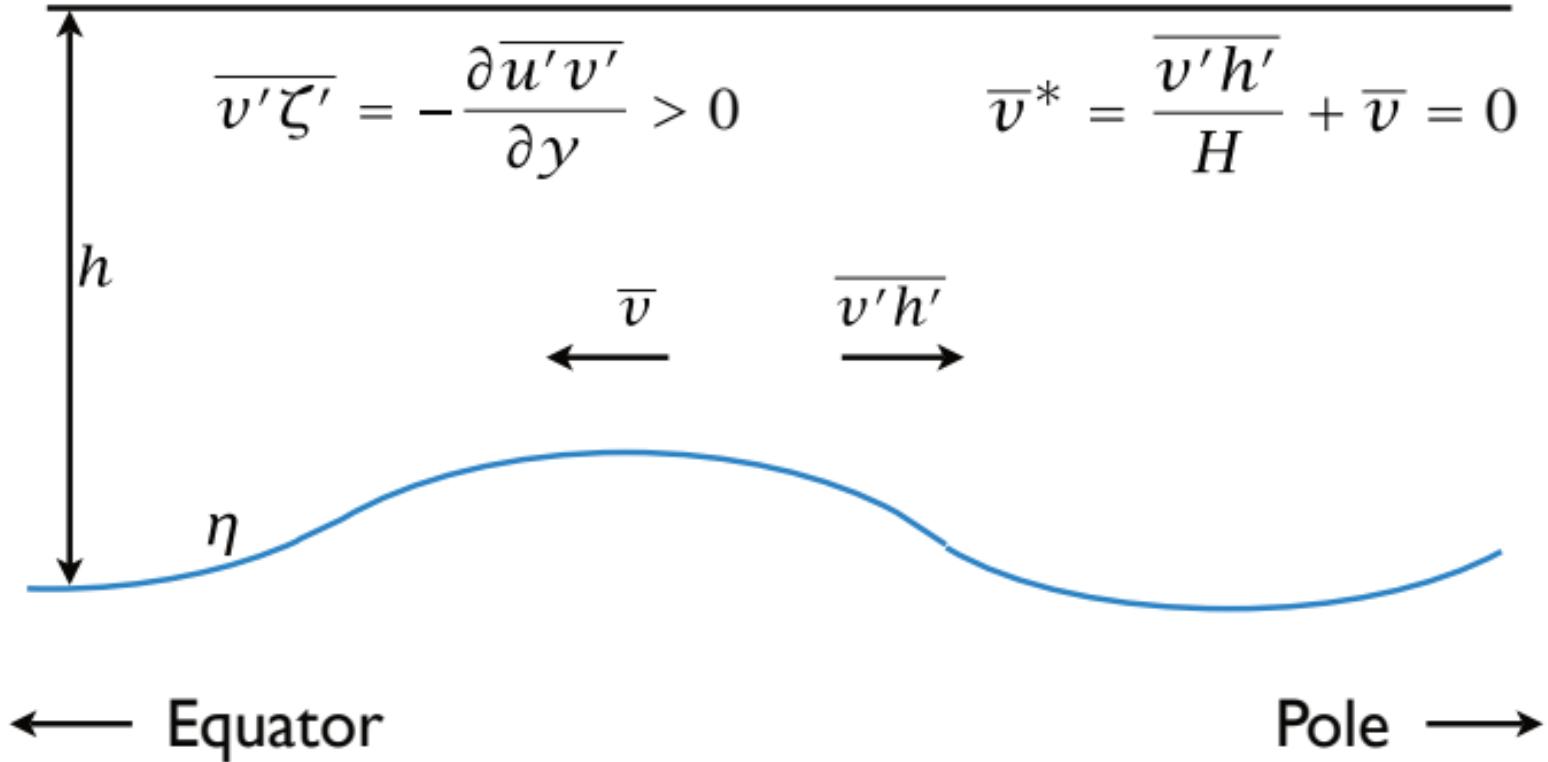


Fig. 15.10

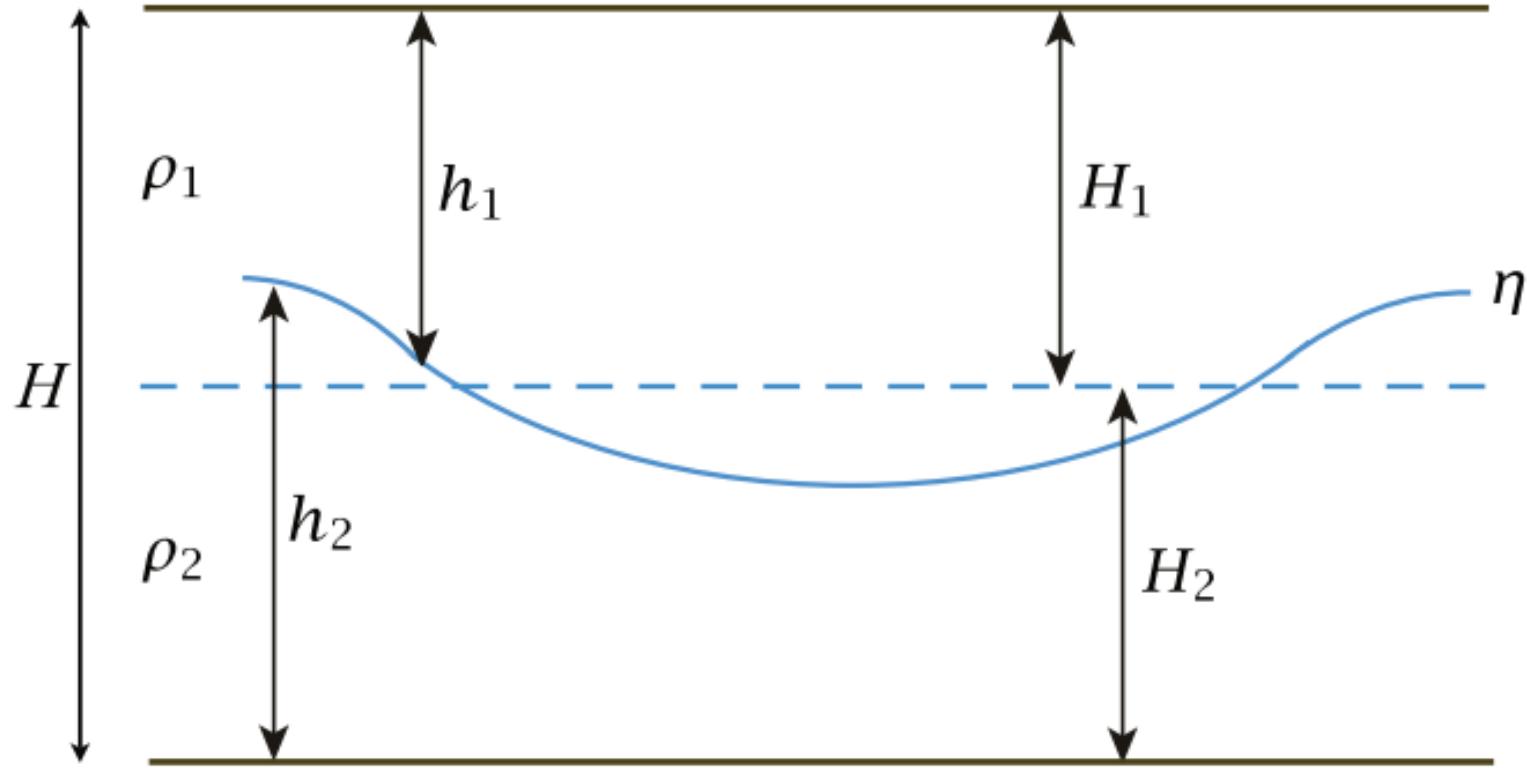


Fig. 15.11

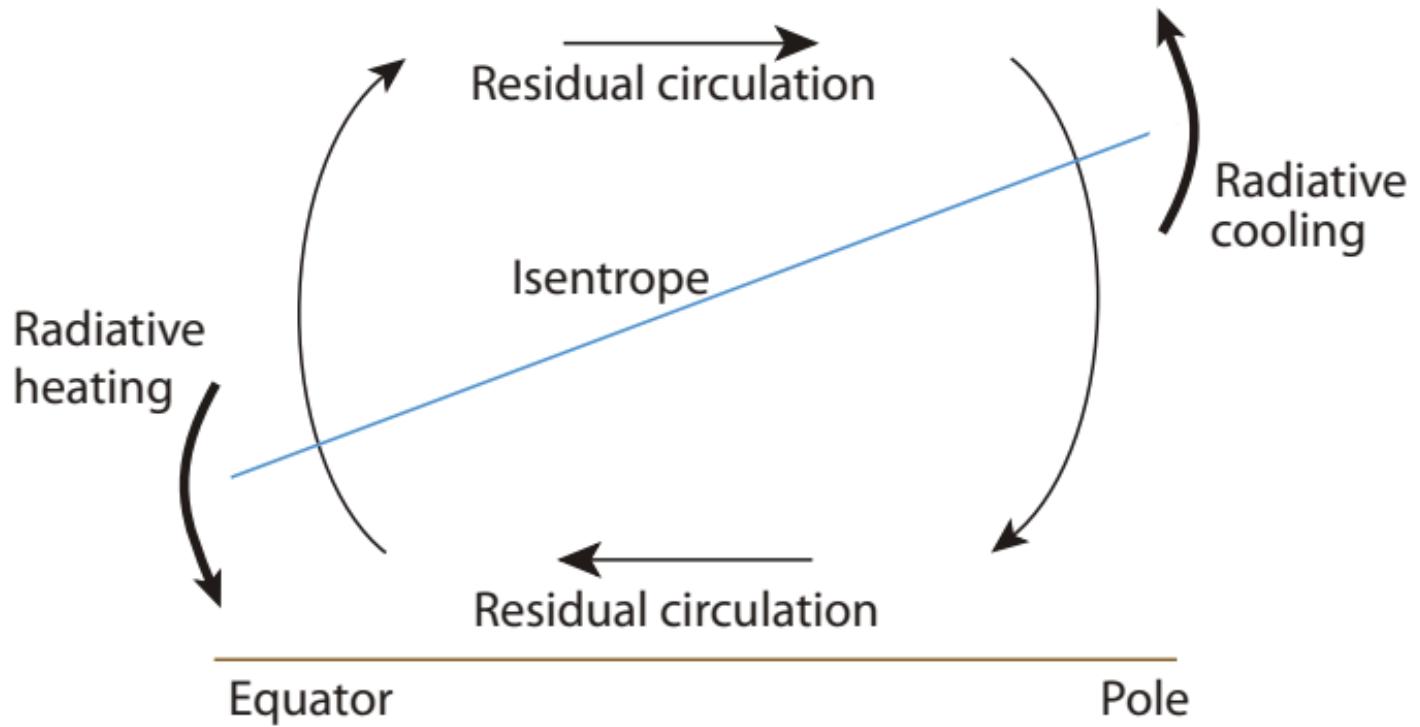


Fig. 15.12

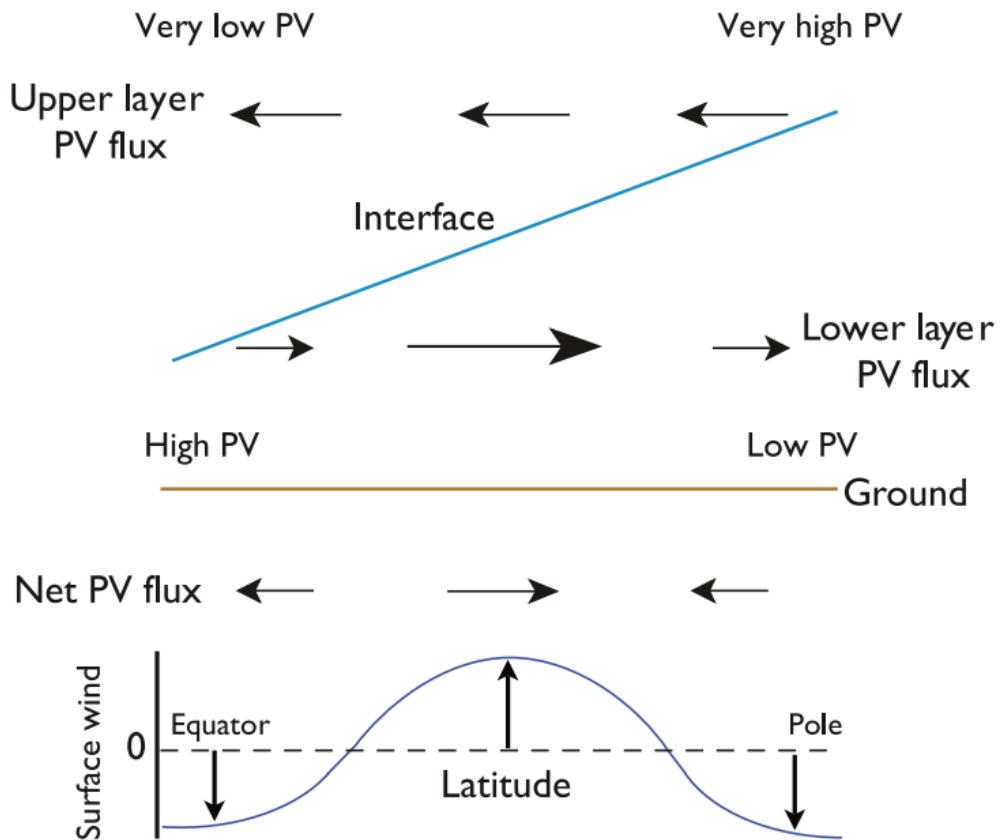


Fig. 15.13

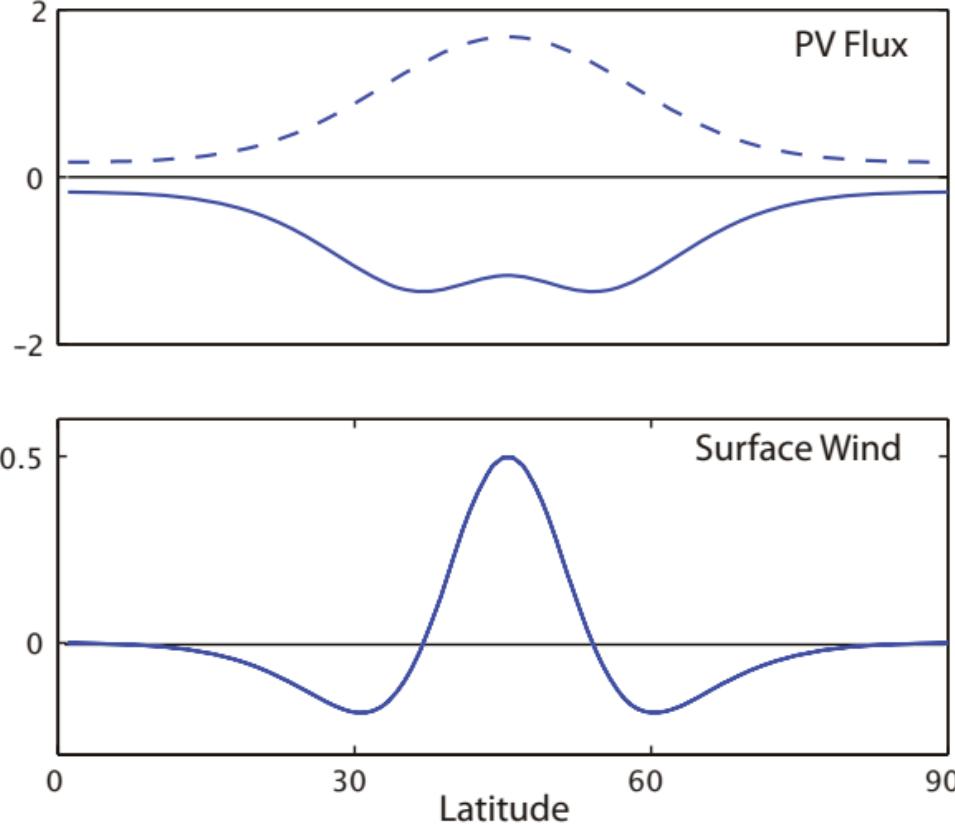
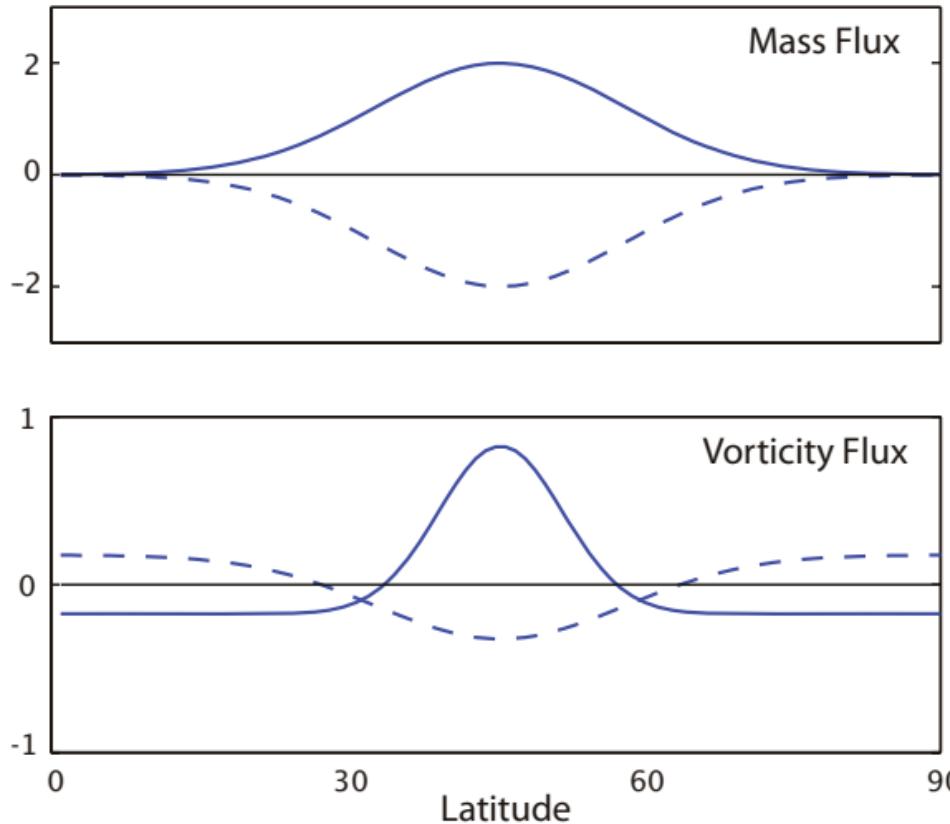
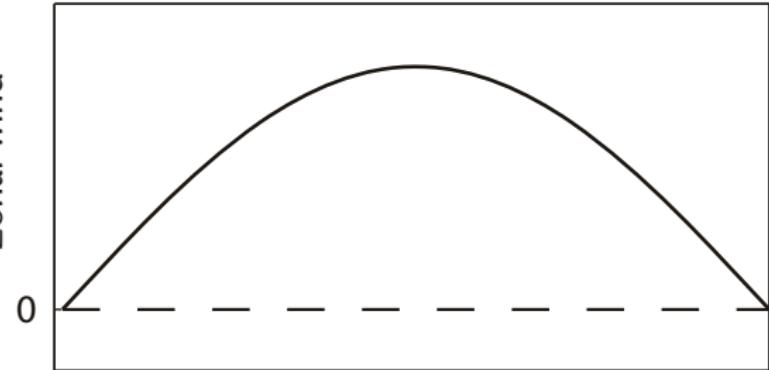
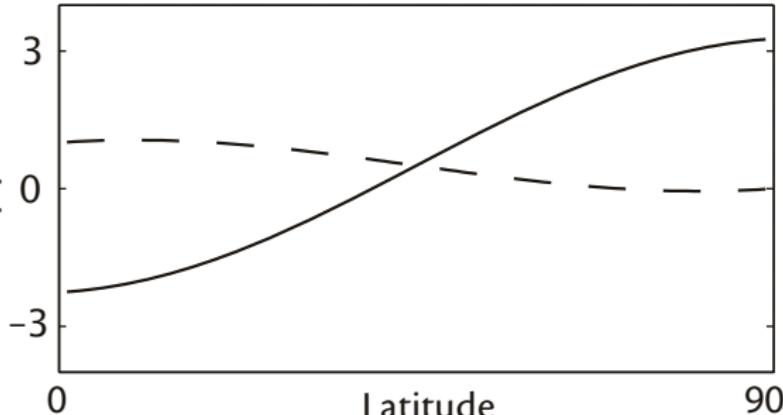


Fig. 15.14

Zonal wind



PV



PV flux

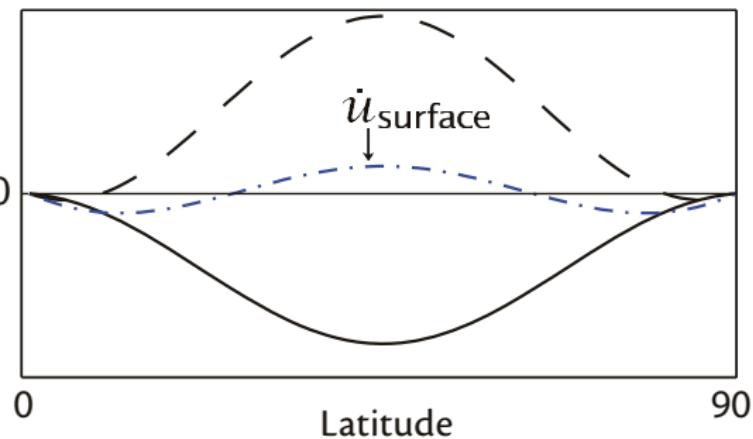


Fig. 15.15

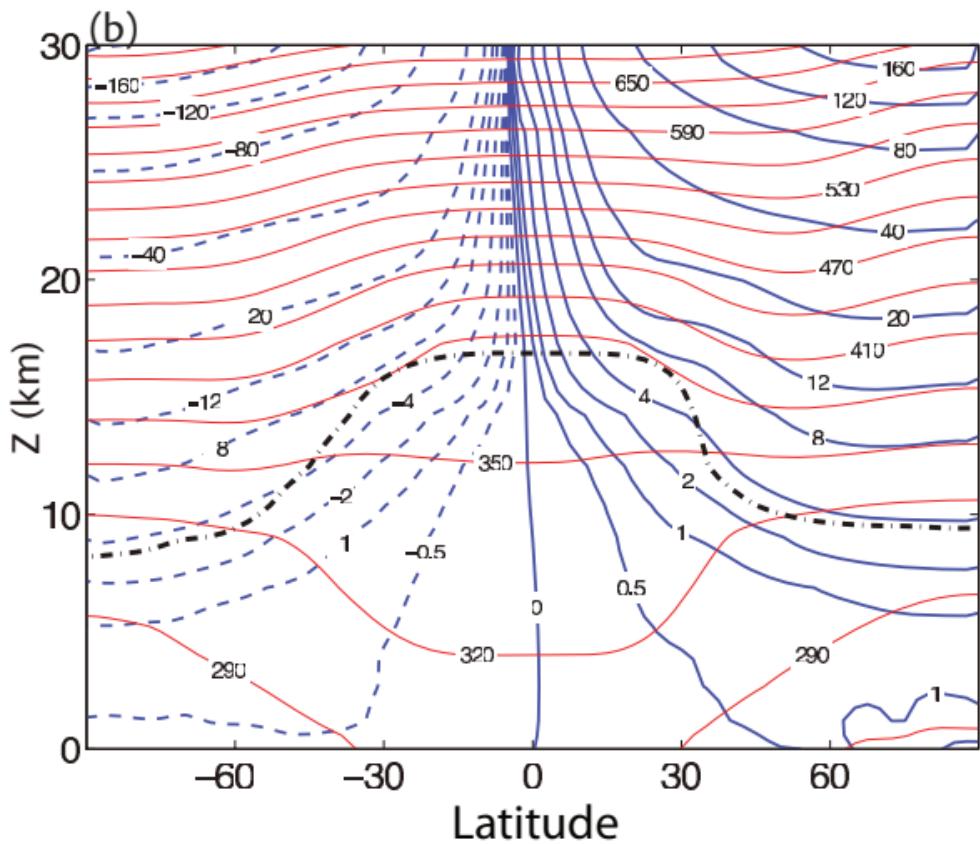
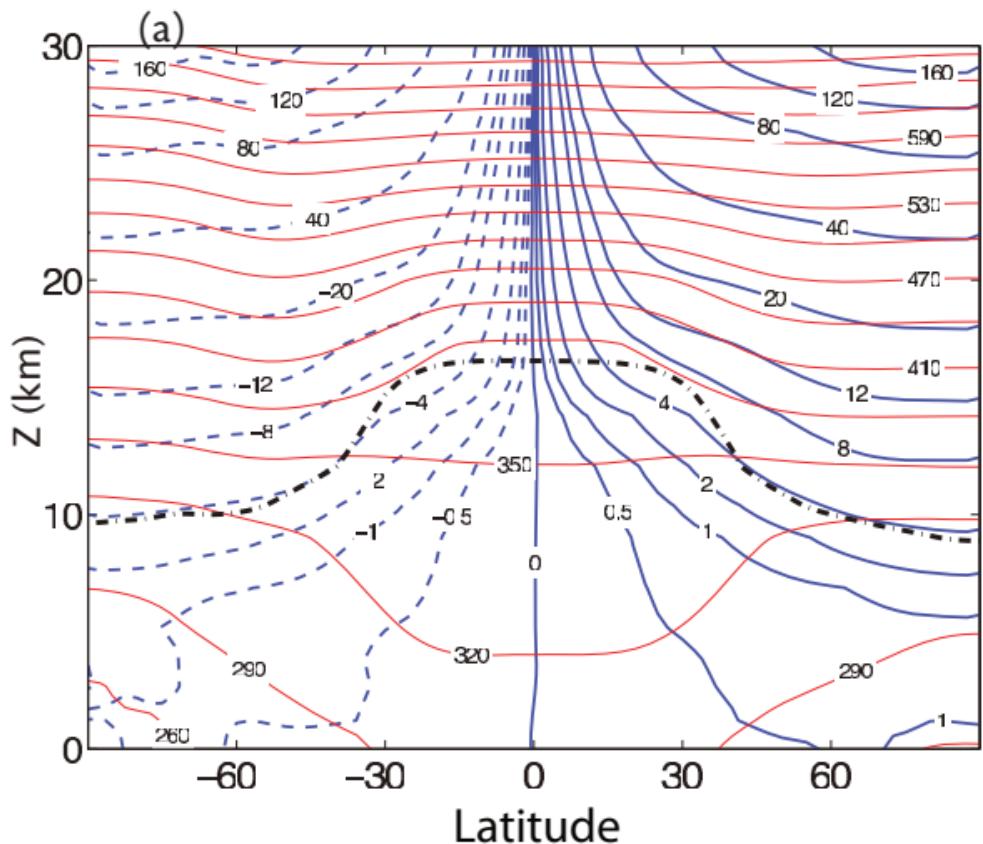
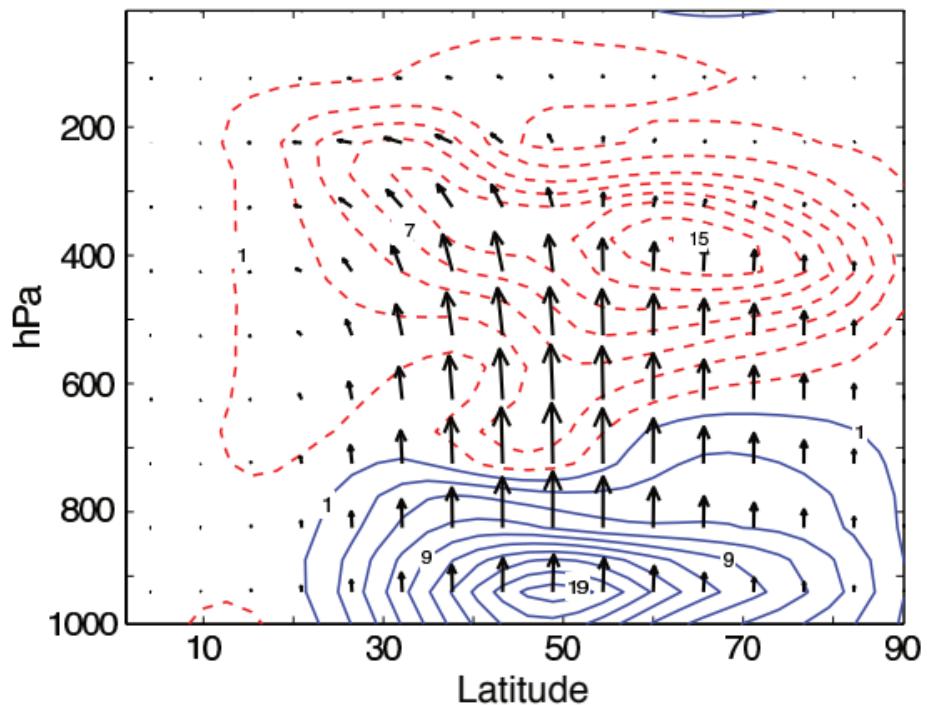


Fig. 15.16

(a)



(b)

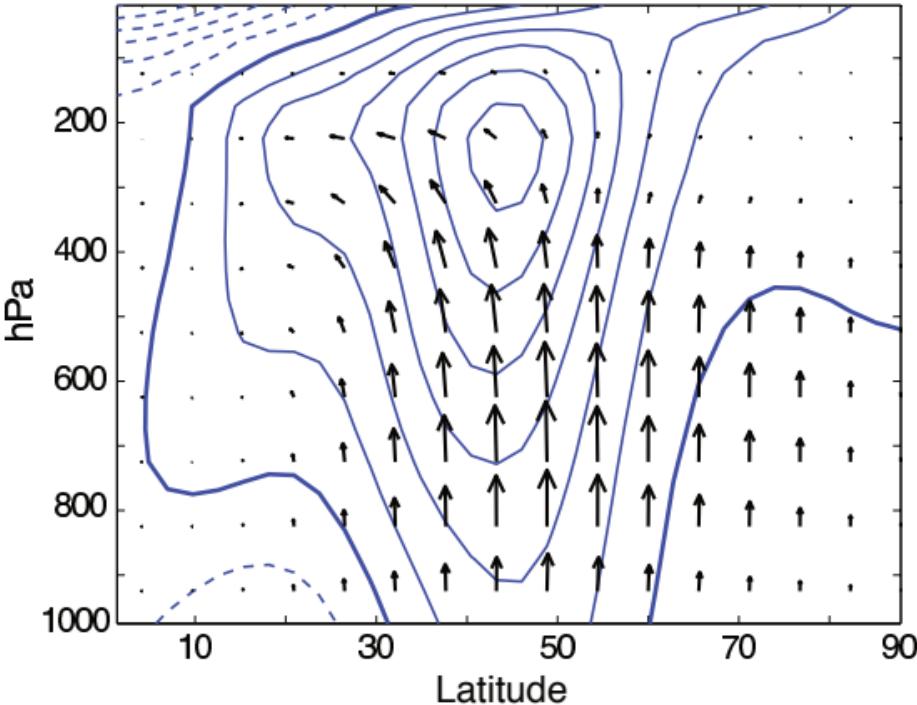
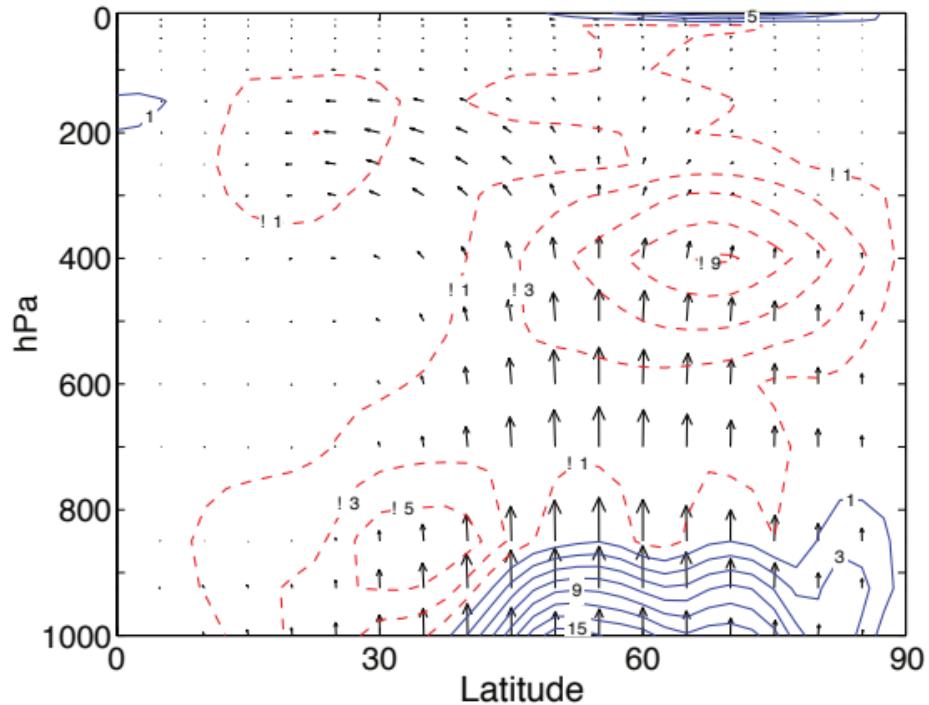


Fig. 15.17

(a)



(b)

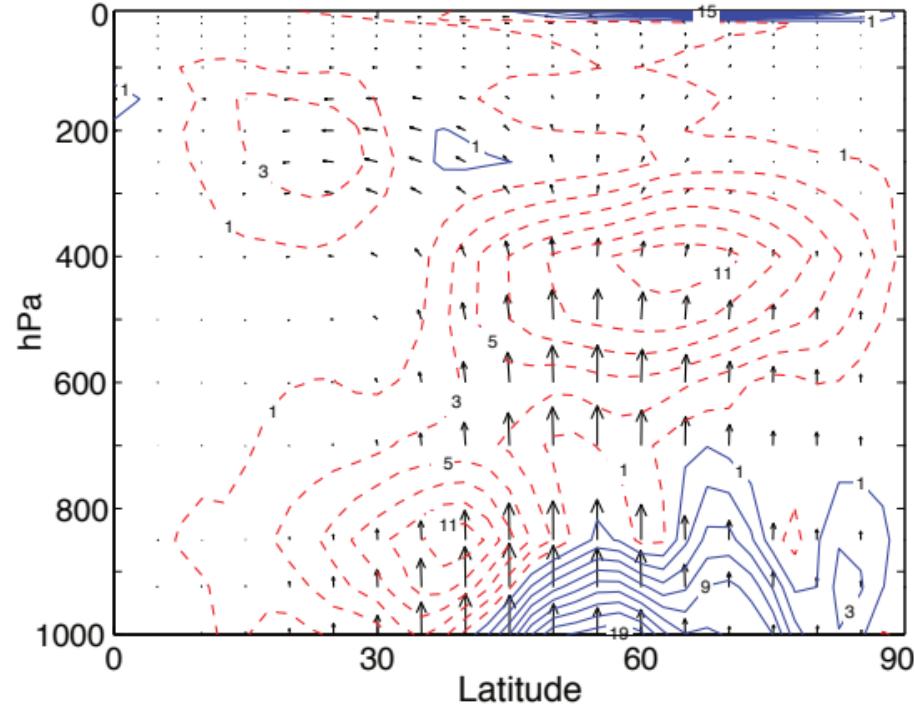


Fig. 15.18

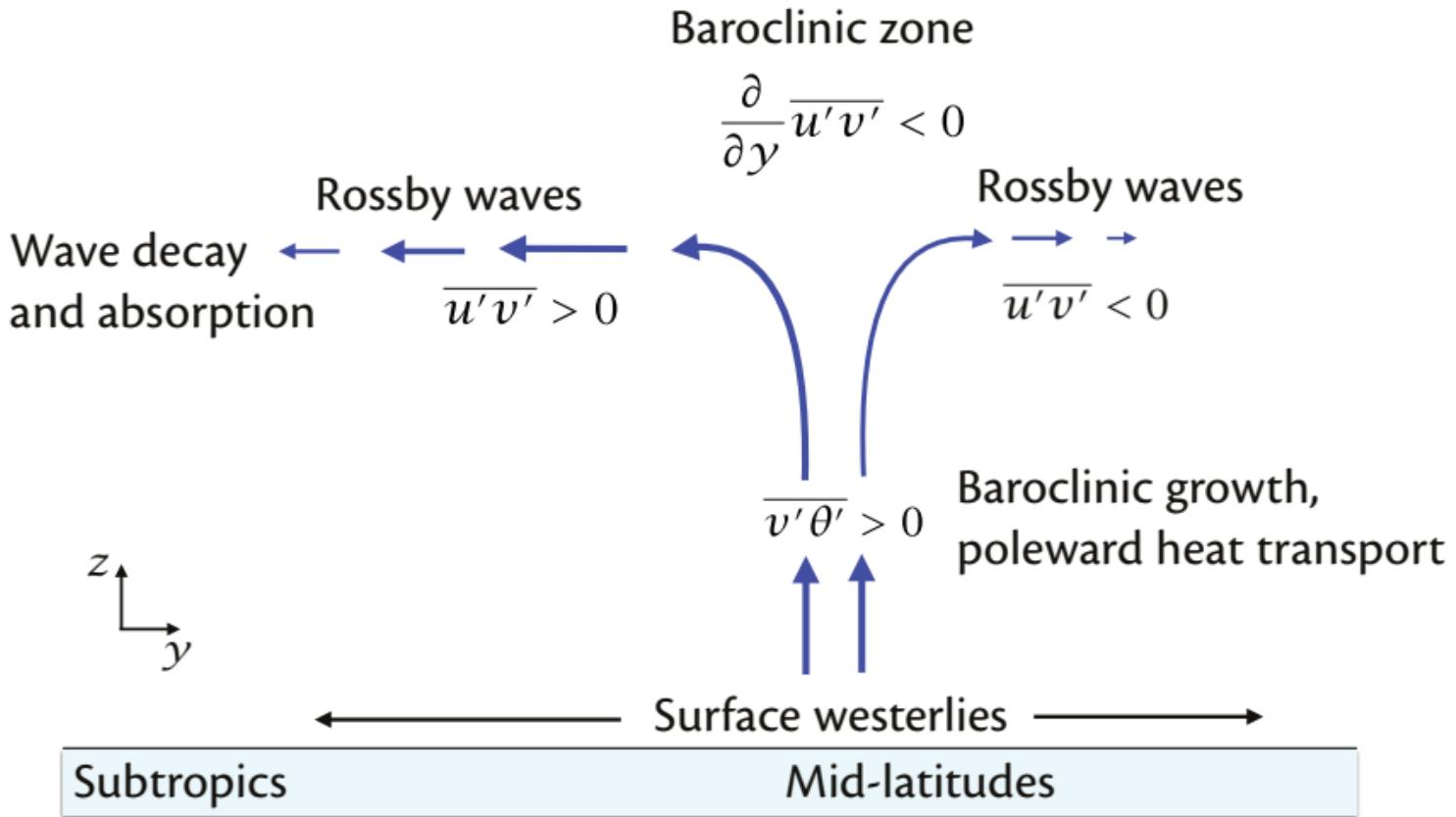


Fig. 15.19

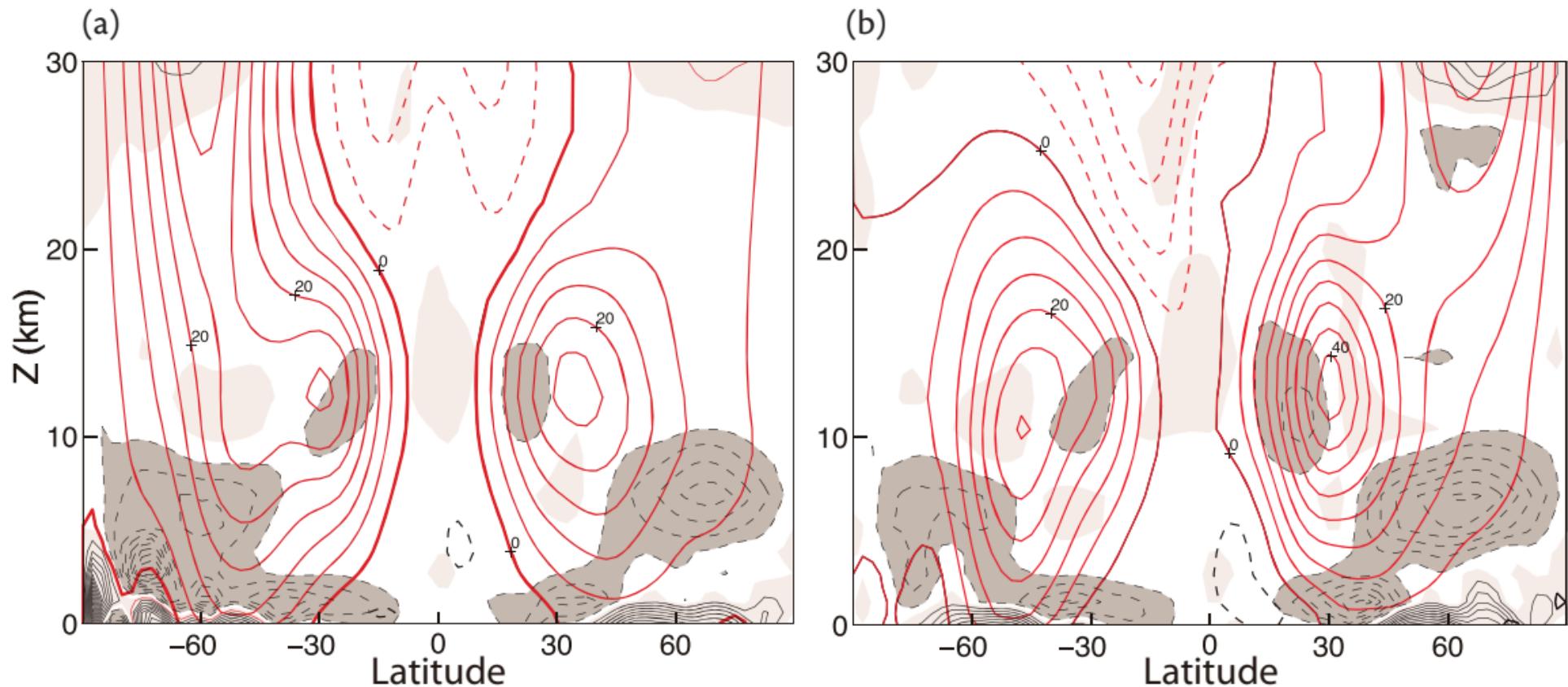


Fig. 15.20

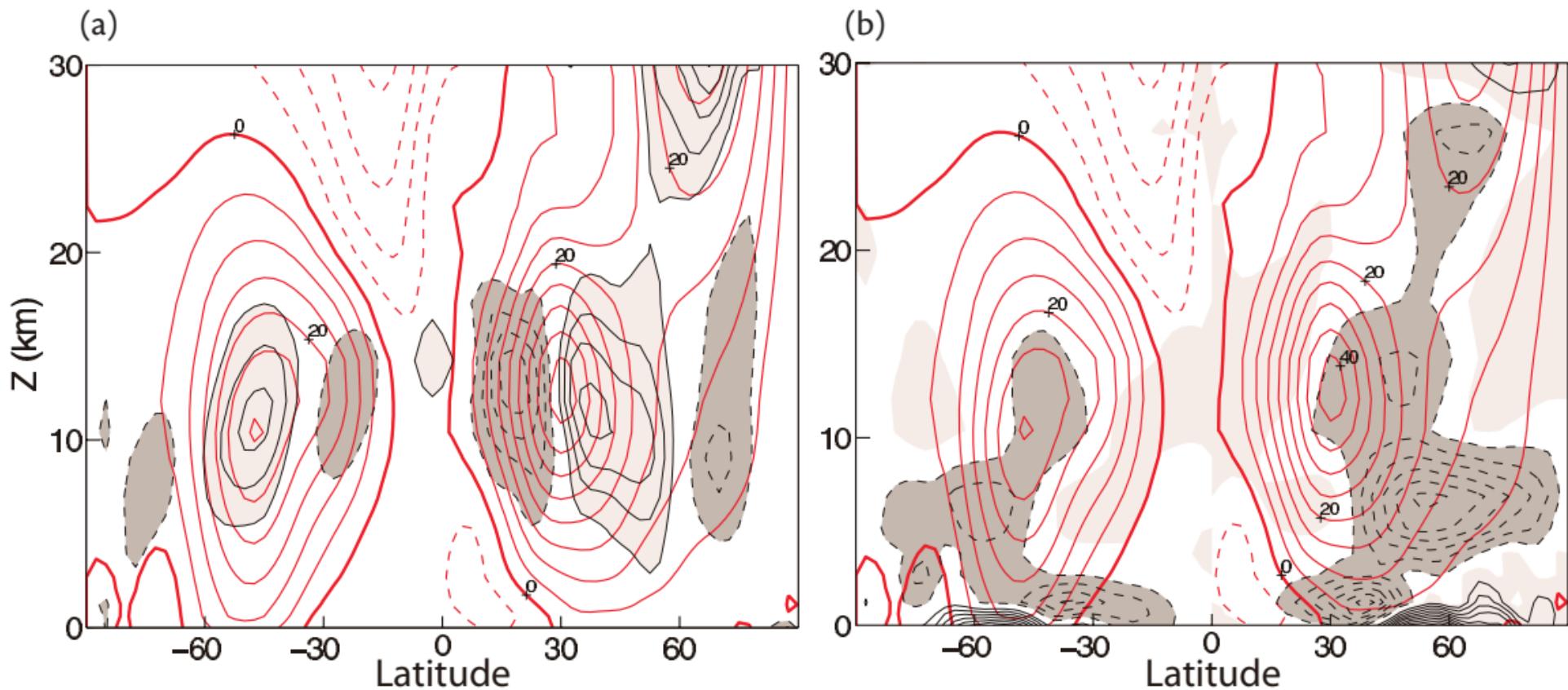


Fig. 15.21

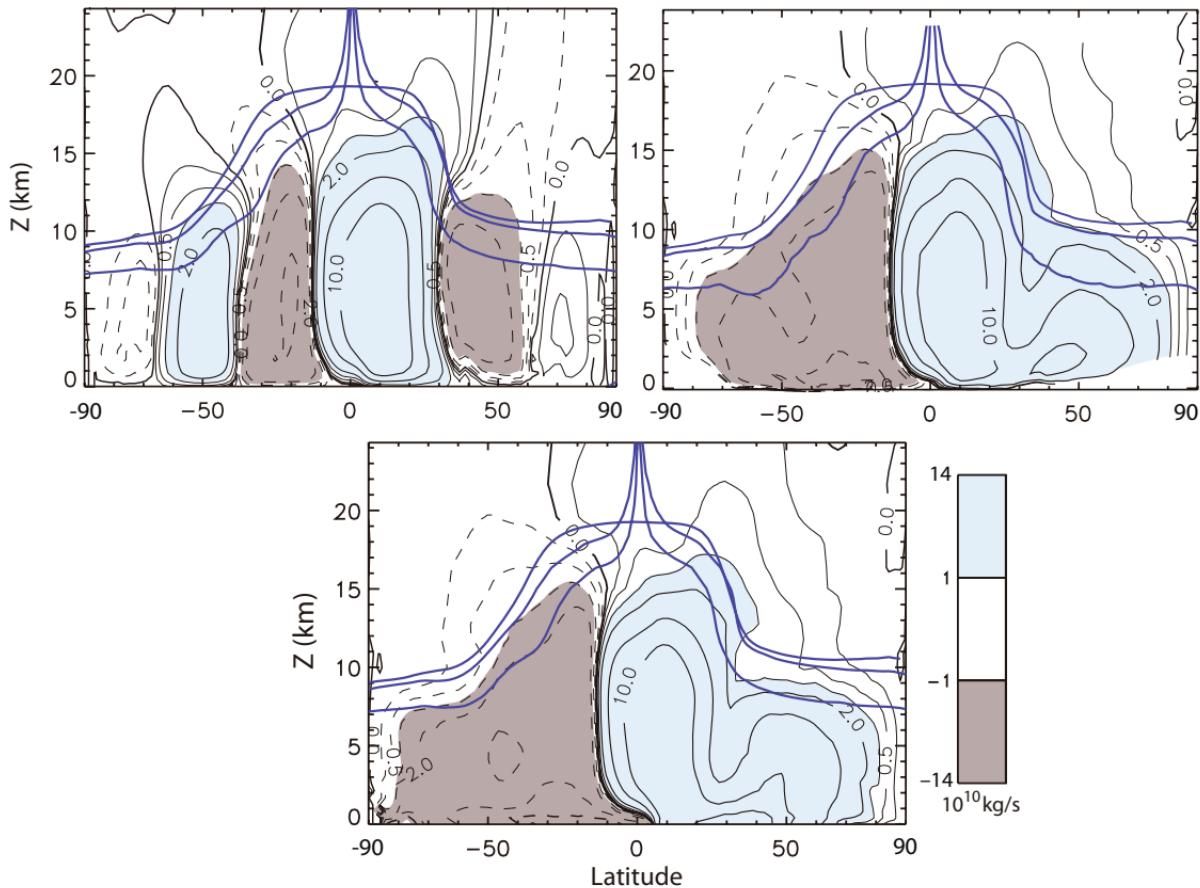


Fig. 15.22

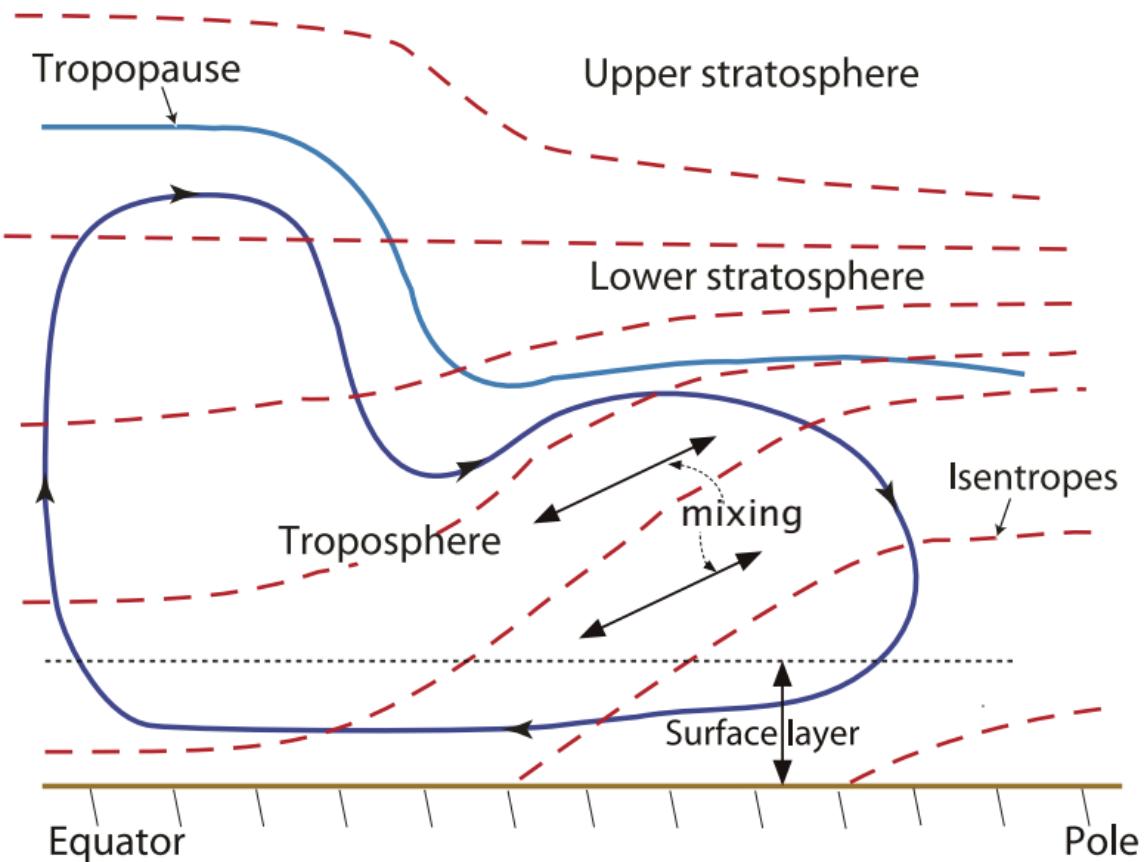


Fig. 15.23

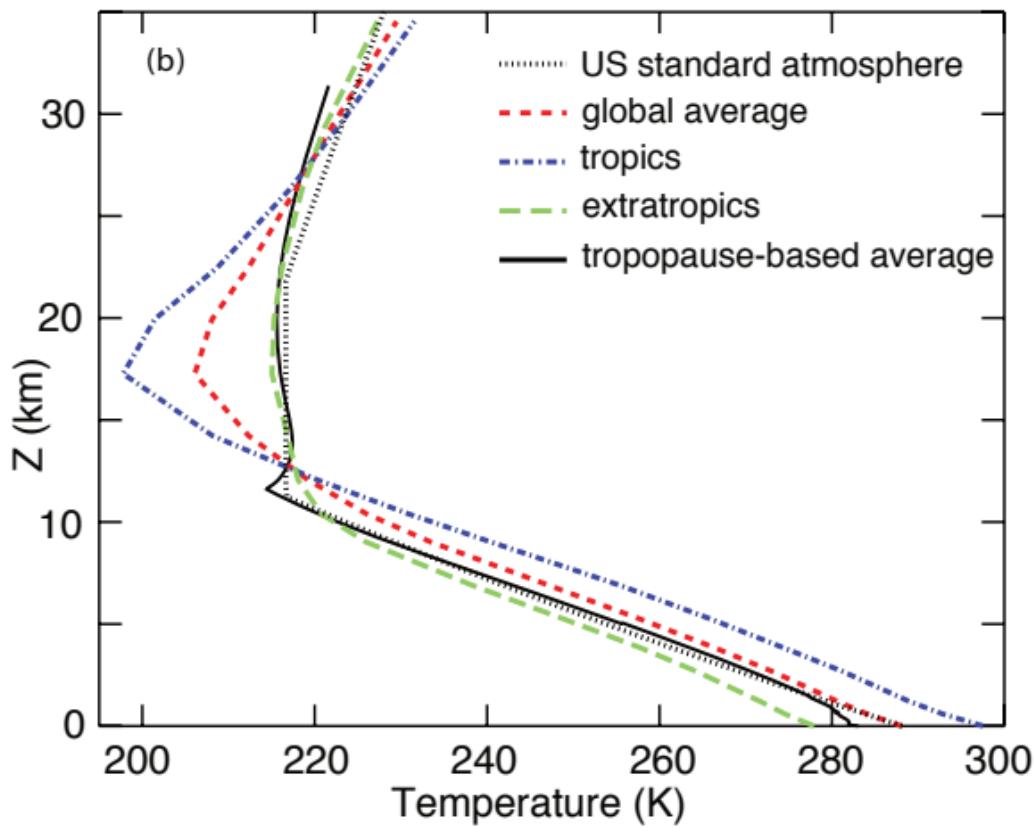
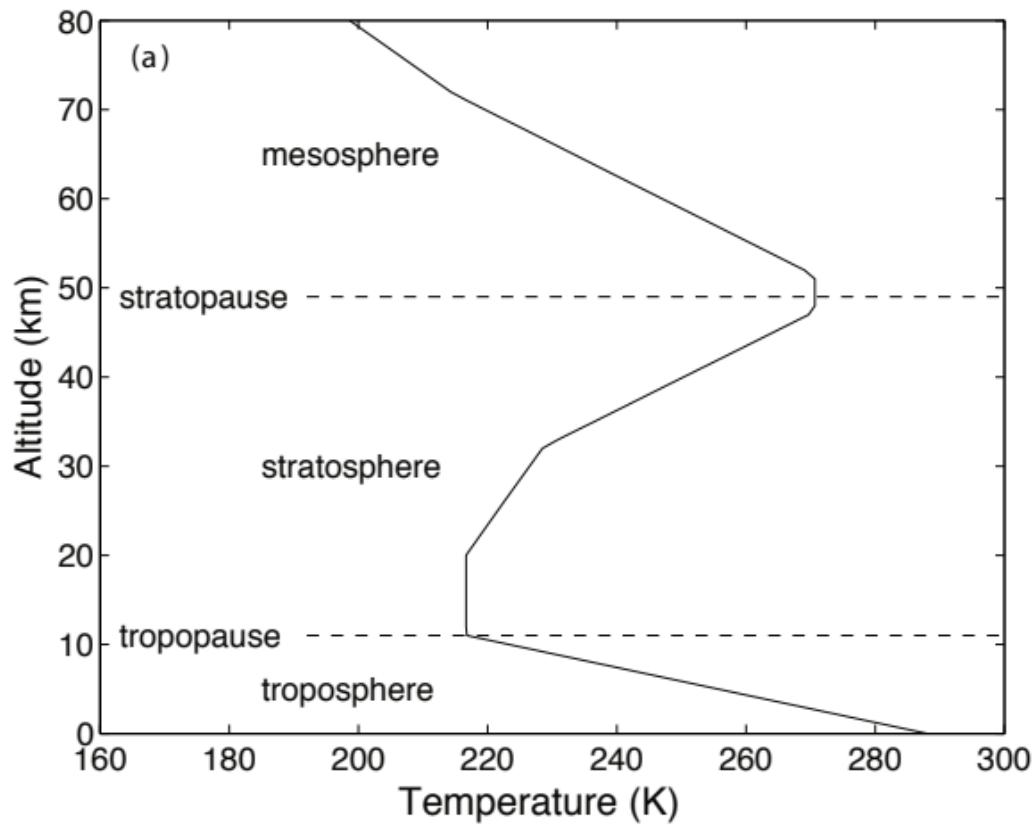


Fig. 15.24

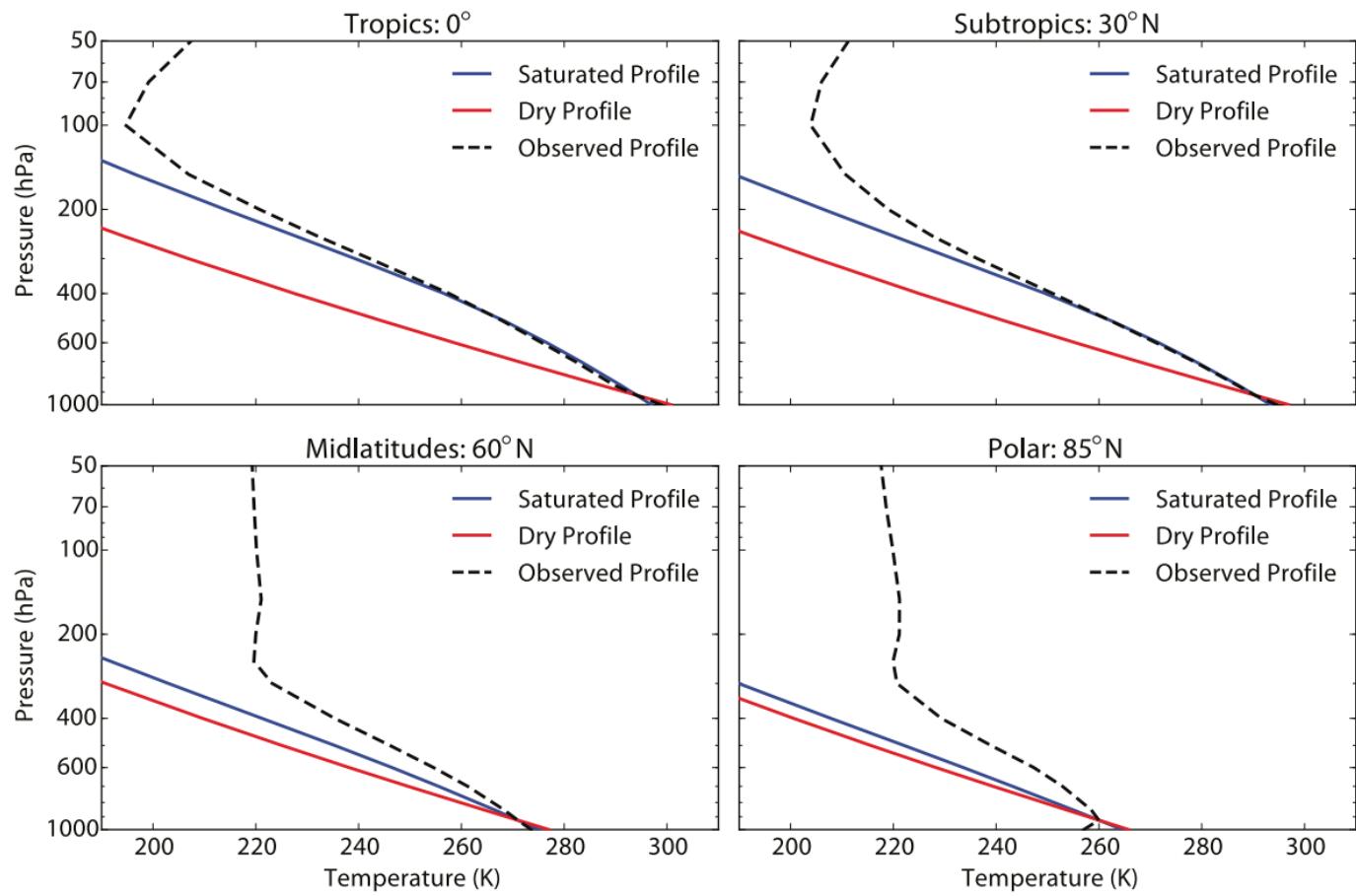


Fig. 15.25

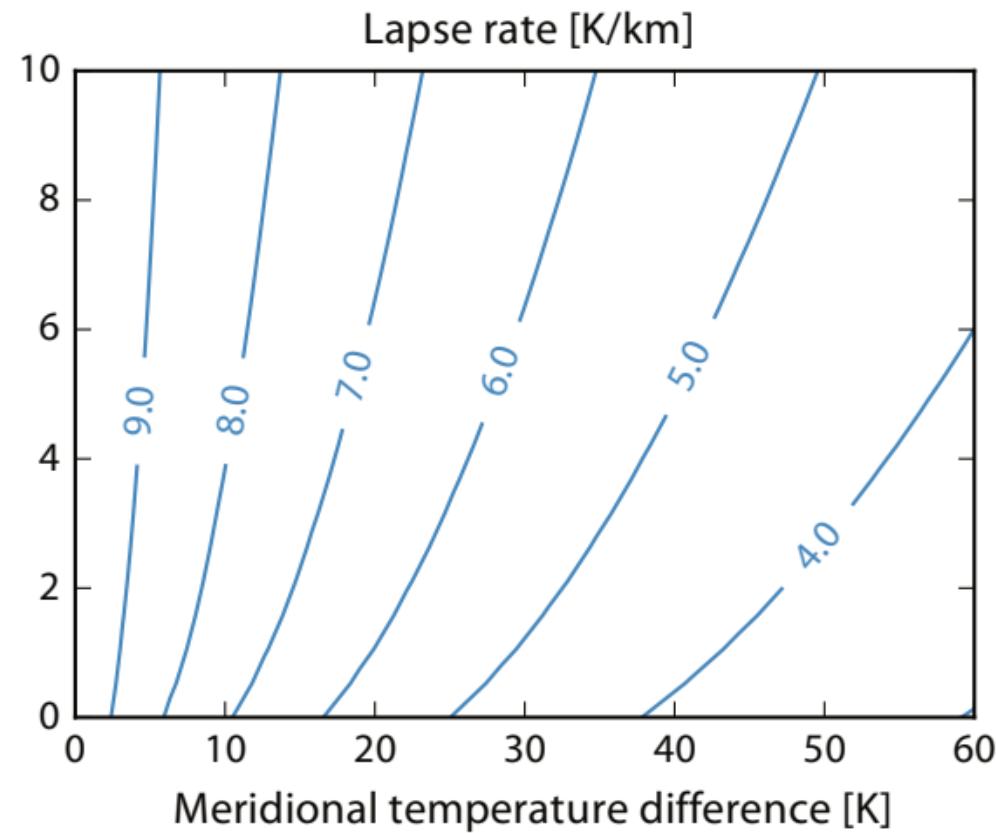
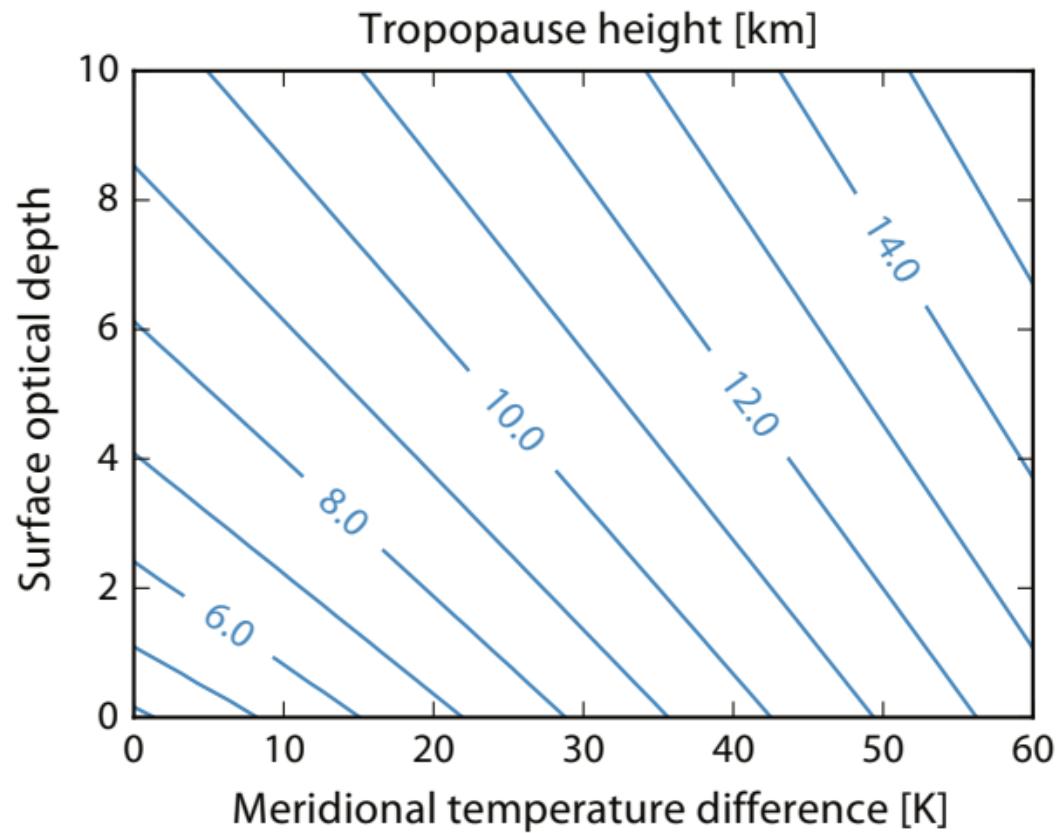


Fig. 15.26

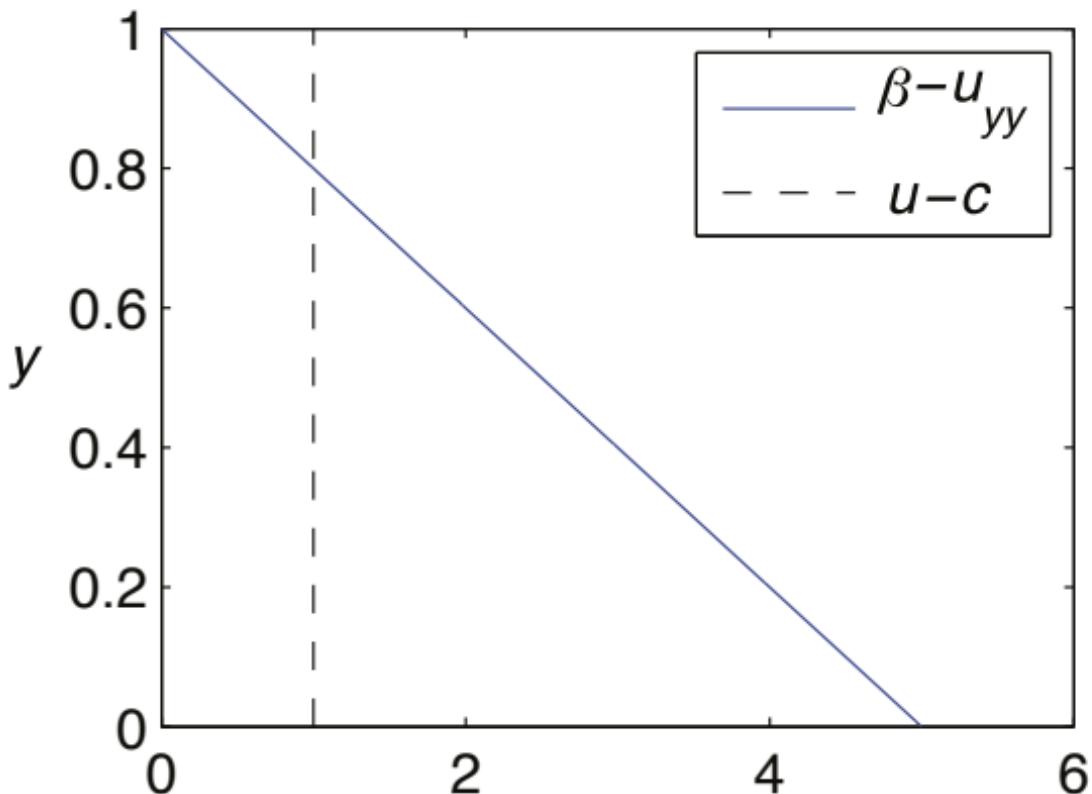


Fig. 16.1

Group velocity

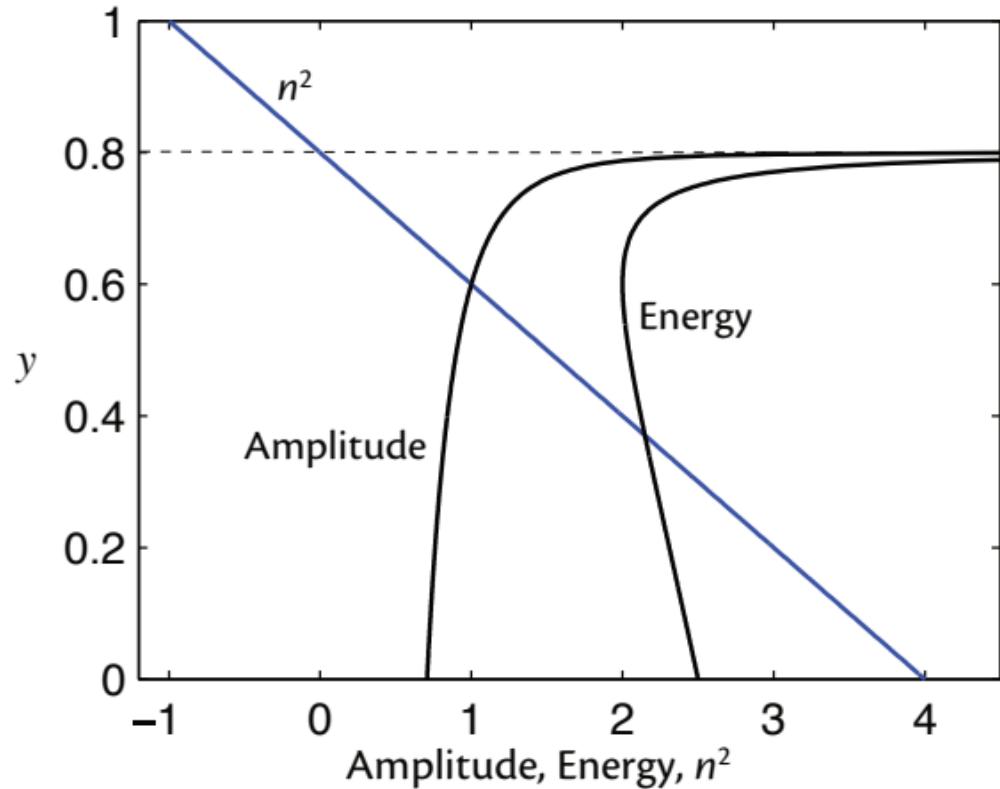
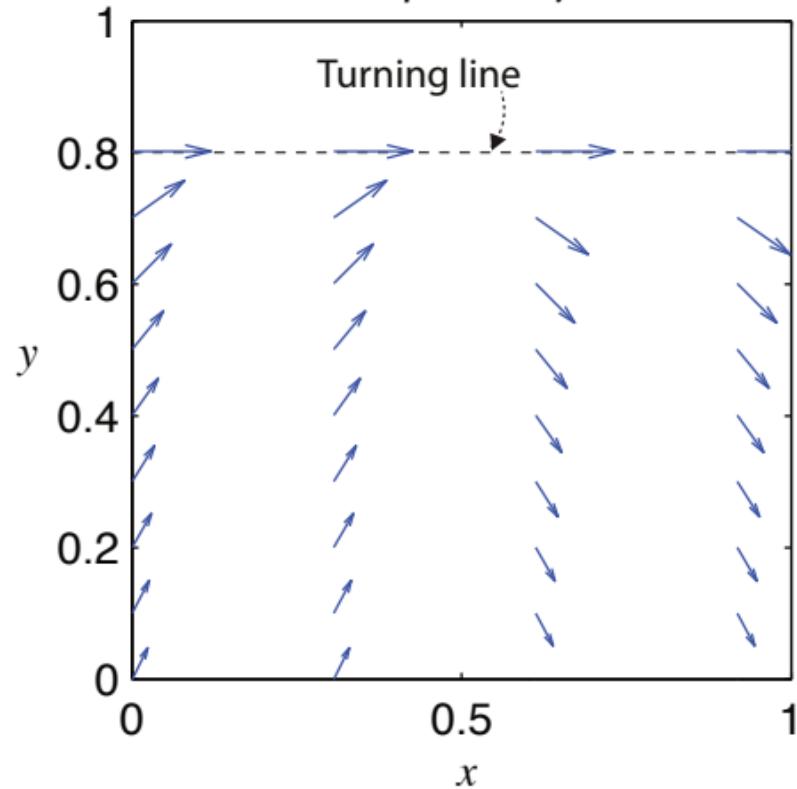


Fig. 16.2

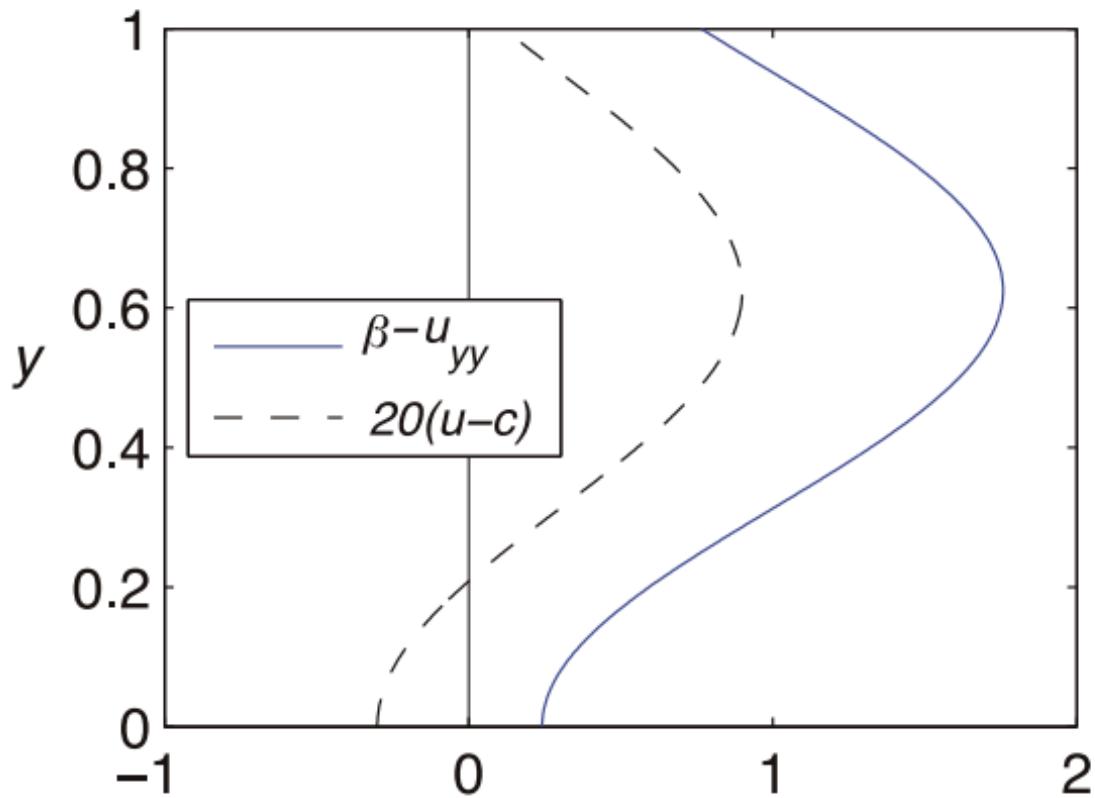


Fig. 16.3

Group velocity

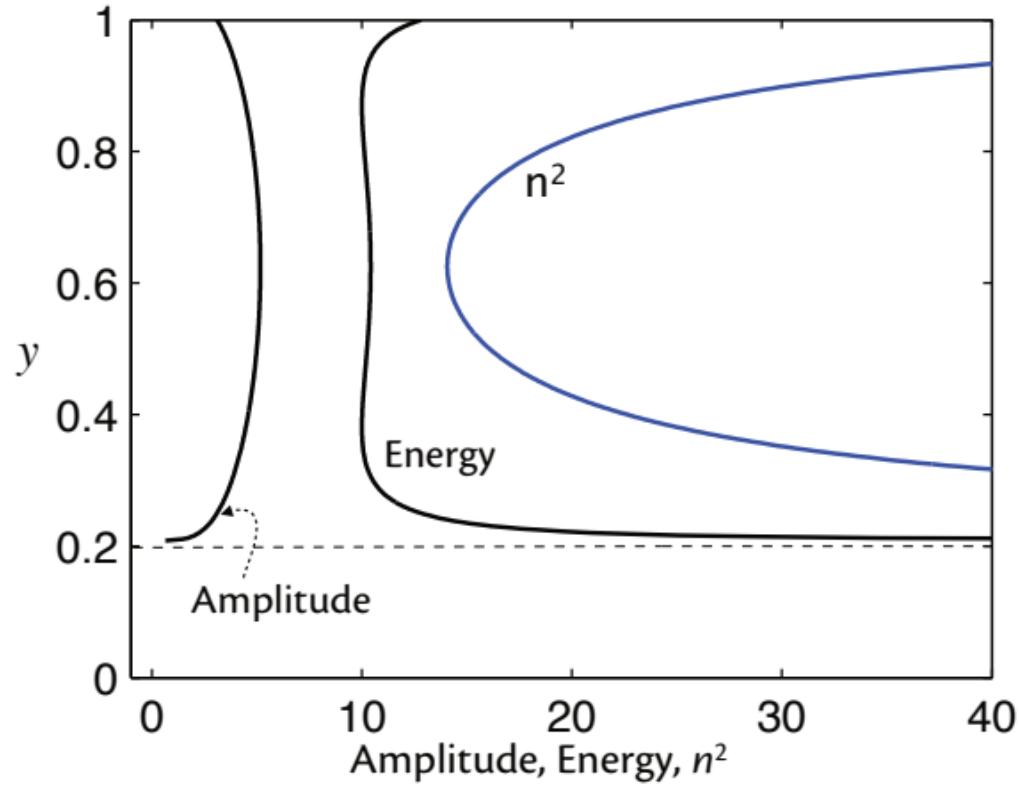
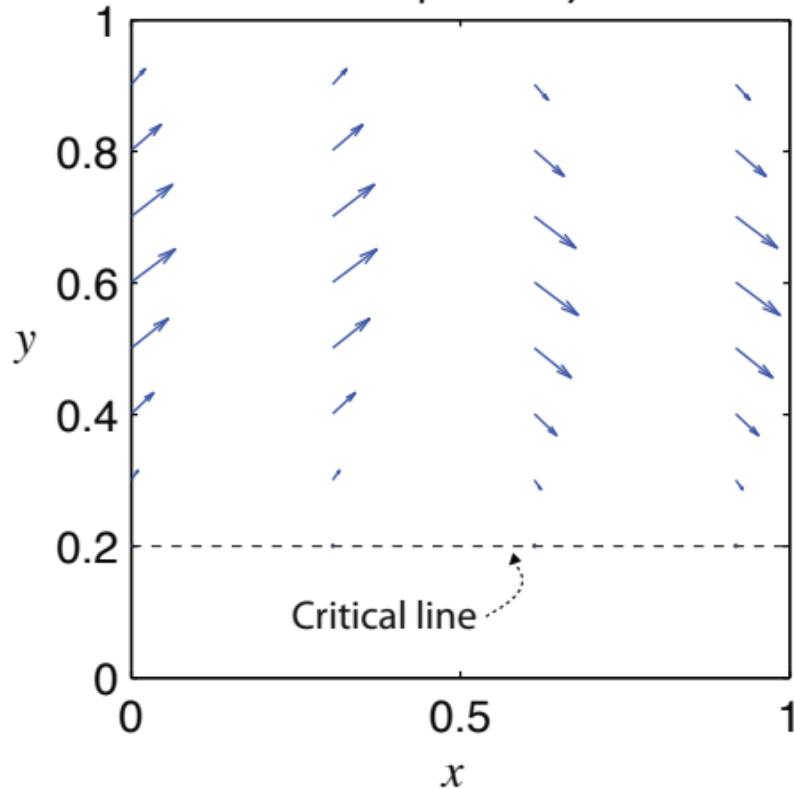


Fig. 16.4

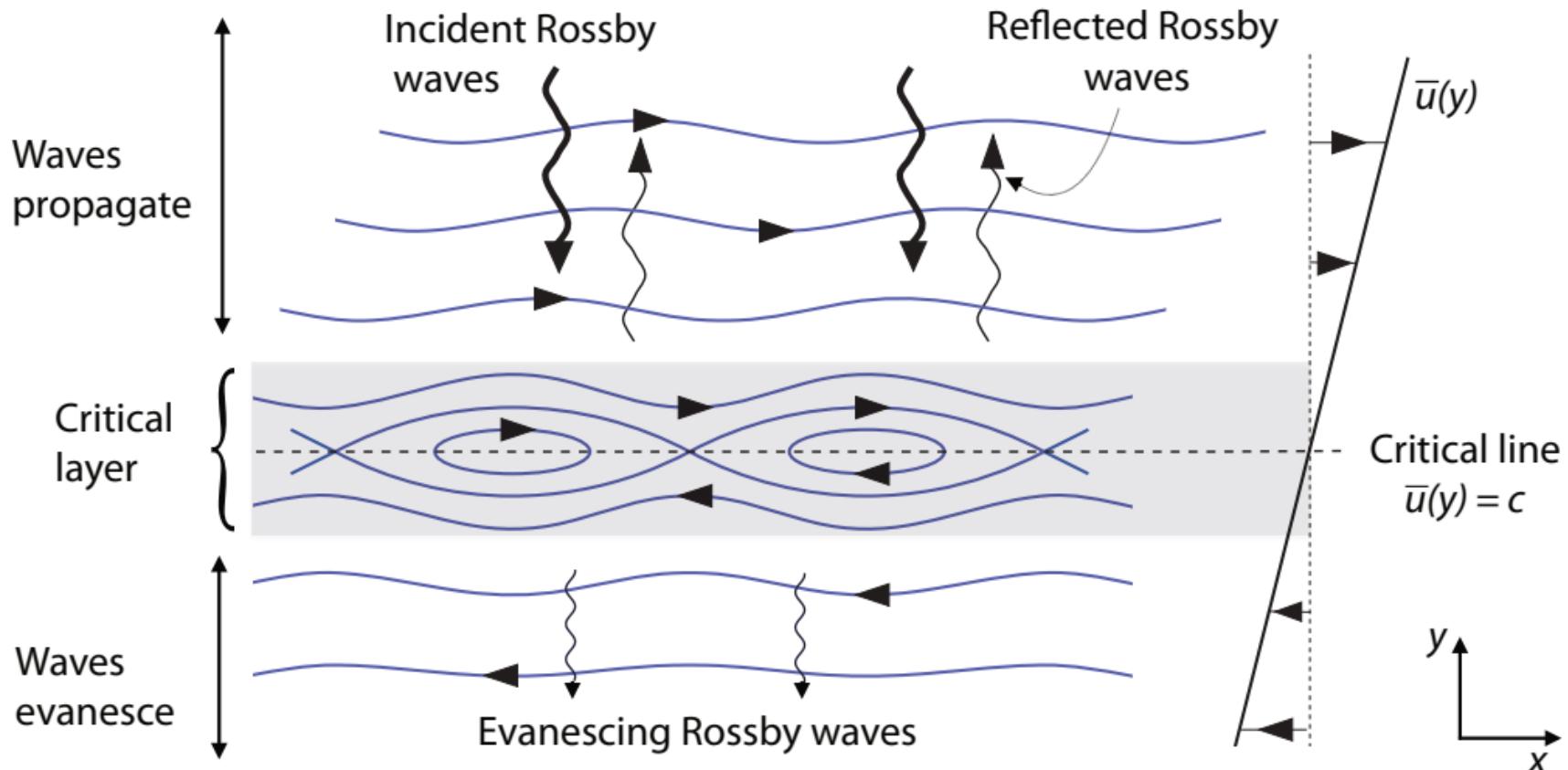


Fig. 16.5

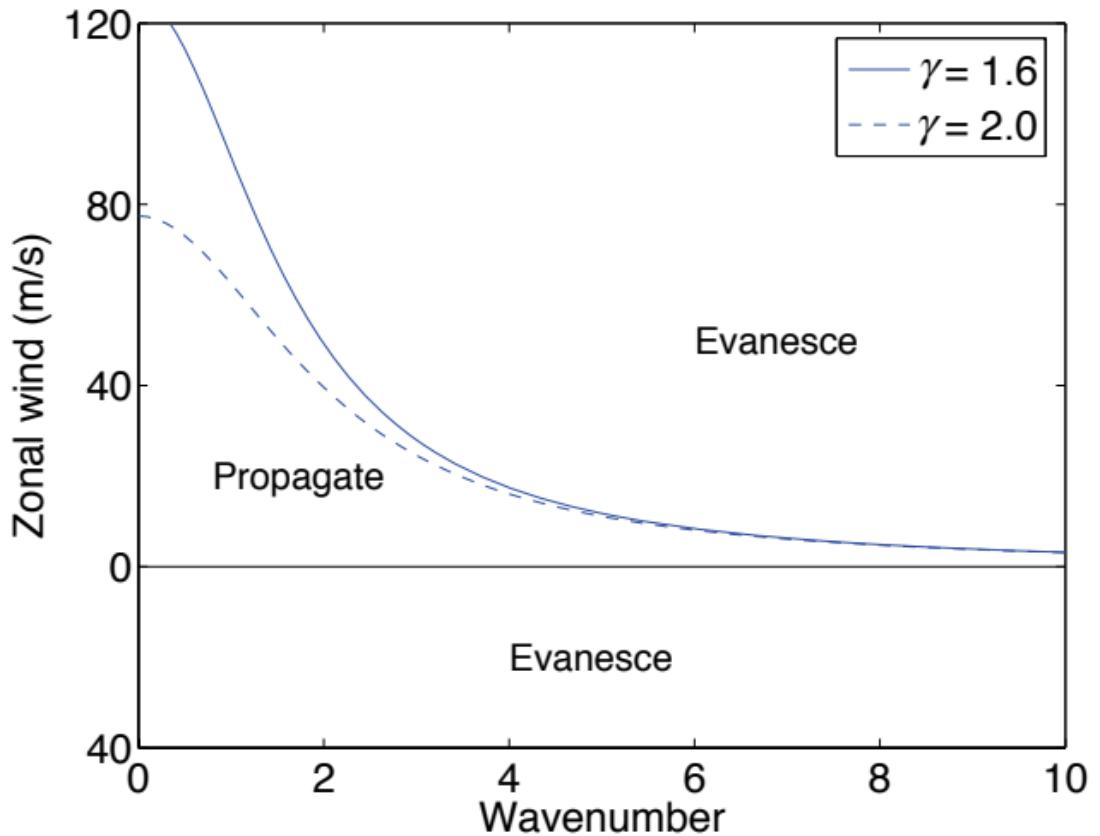


Fig. 16.6

Phase propagation

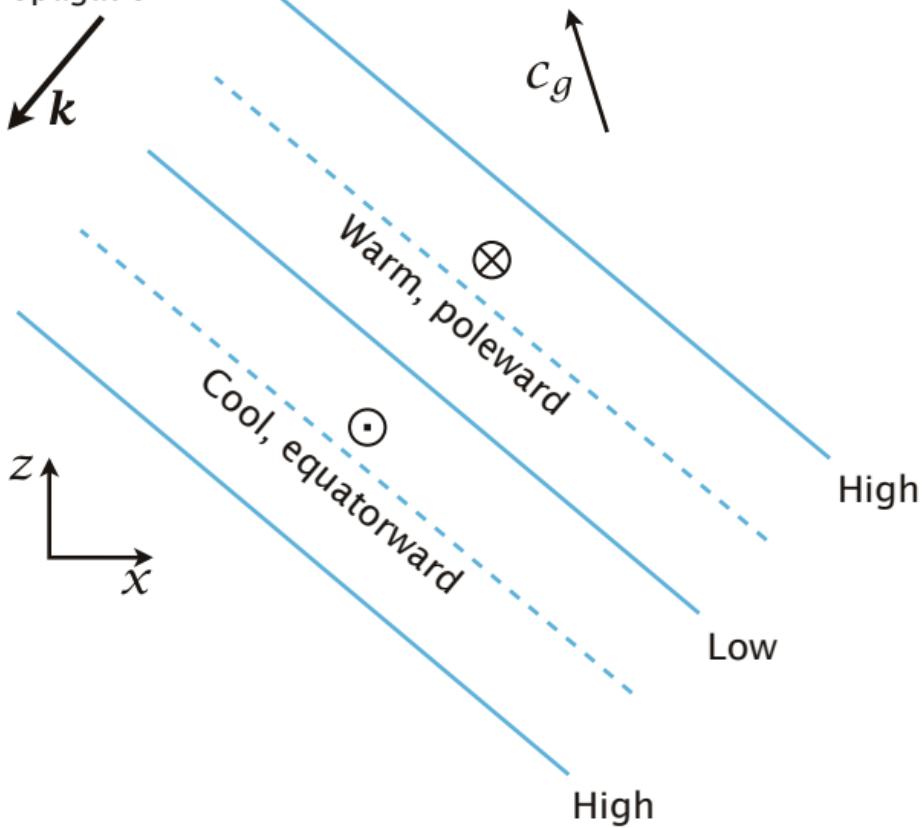


Fig. 16.7

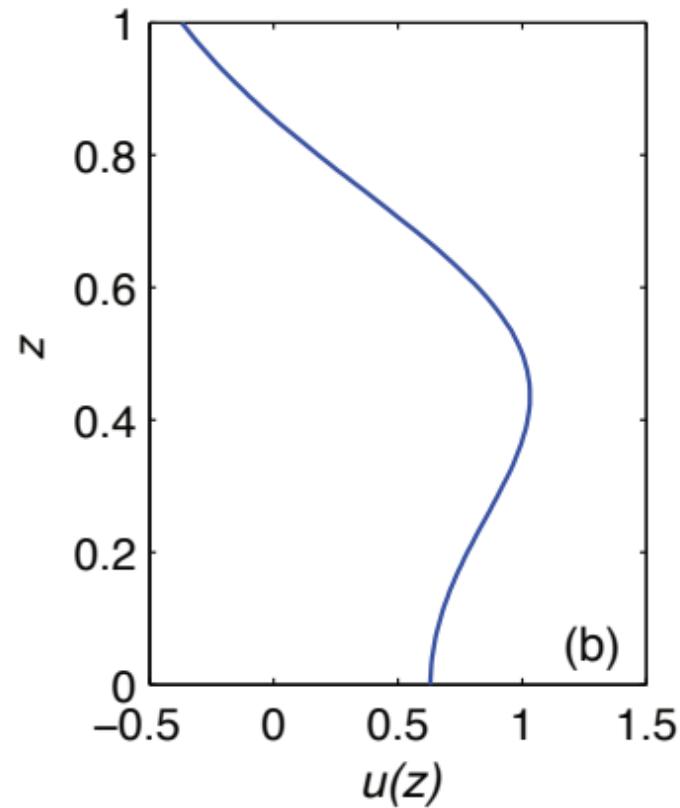
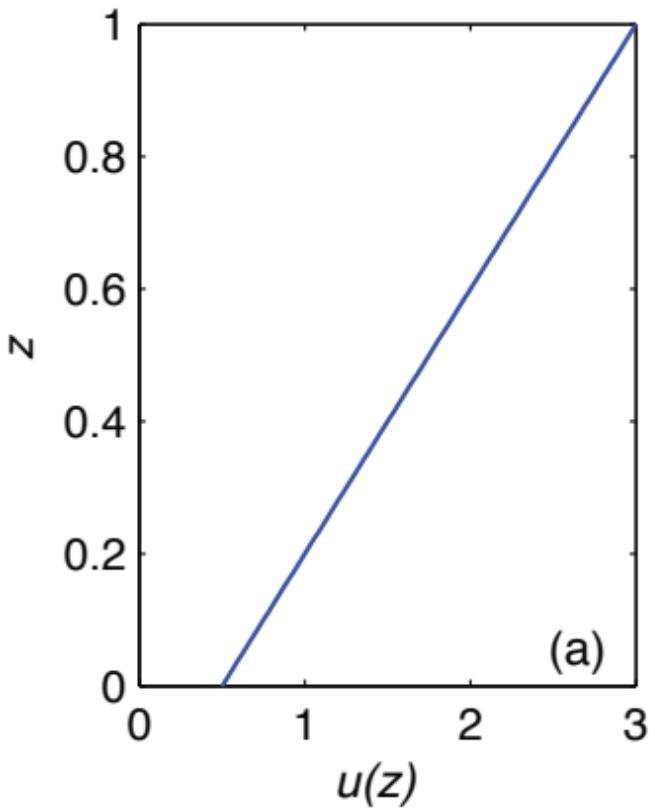
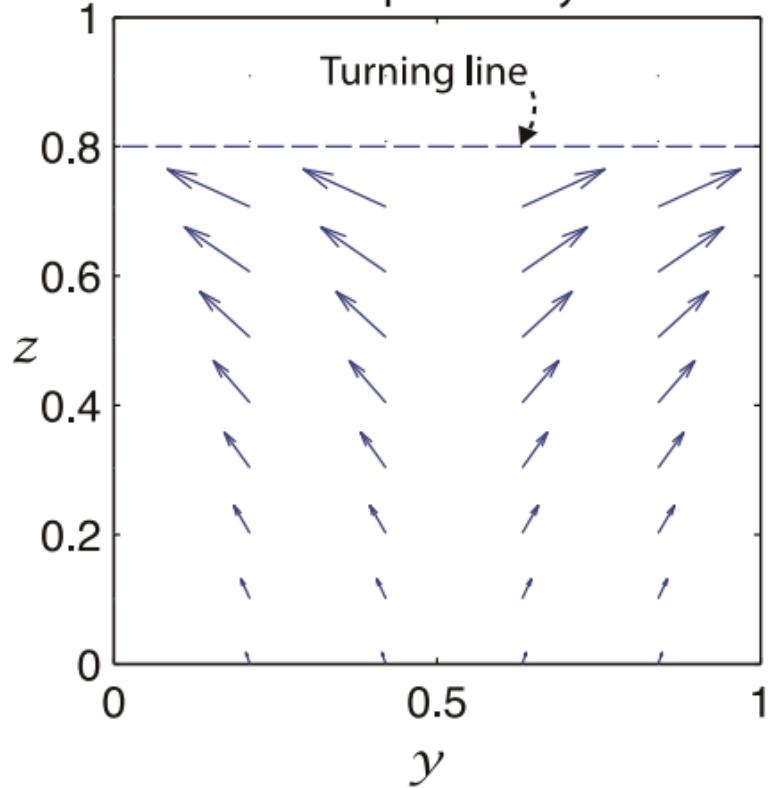


Fig. 16.8

Group velocity



1

0.8

0.6

0.4

0.2

0

0

0.5

y

1

Amplitude

0.8

0.6

0.4

0.2

0

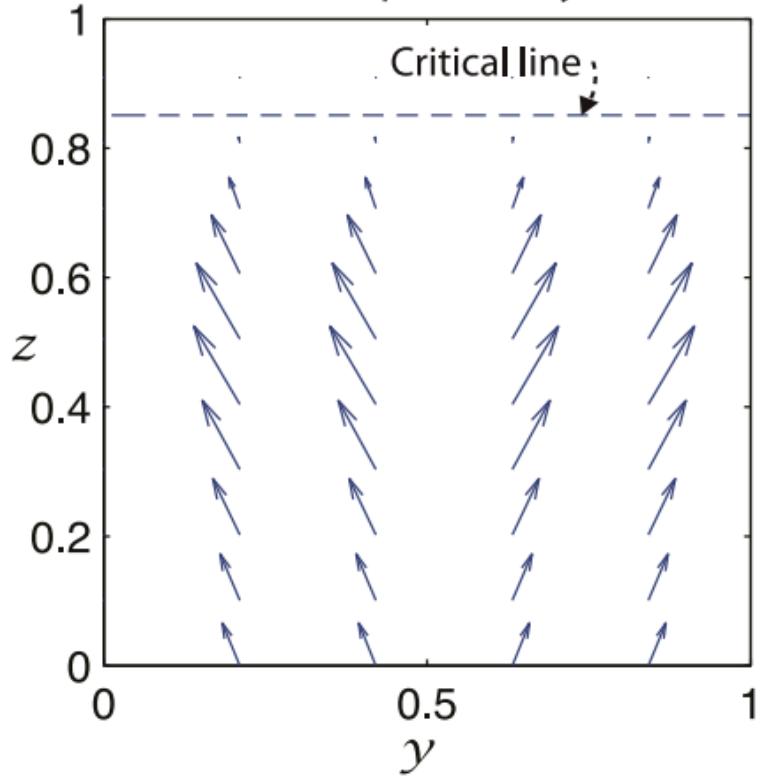
Energy

m^2

Amplitude, Energy, m^2

Fig. 16.9

Group velocity



Amplitude

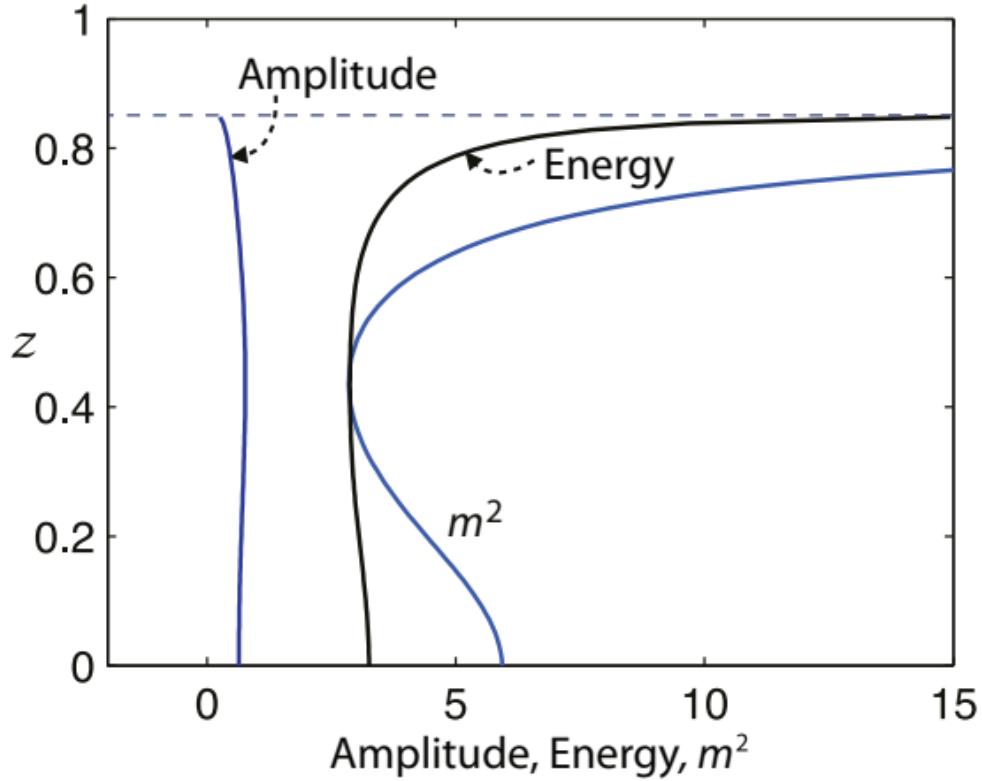


Fig. 16.10

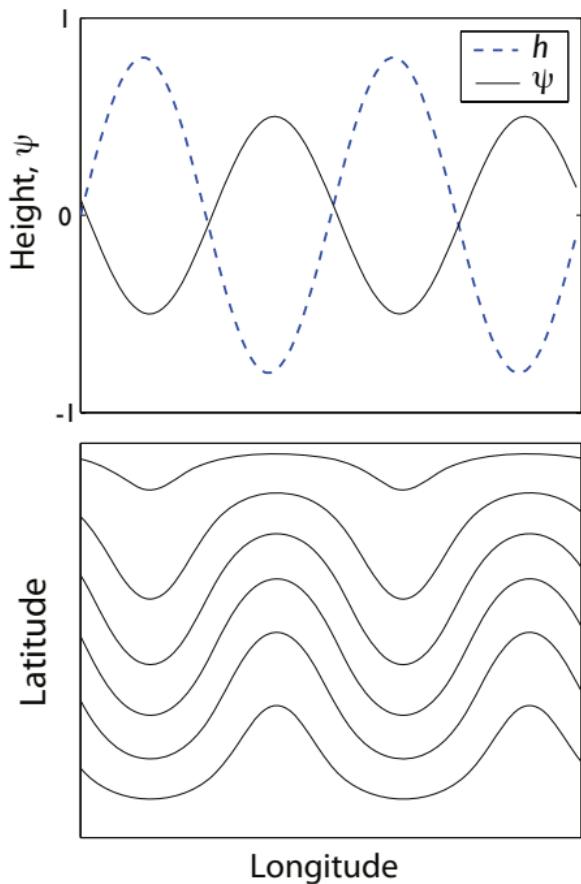
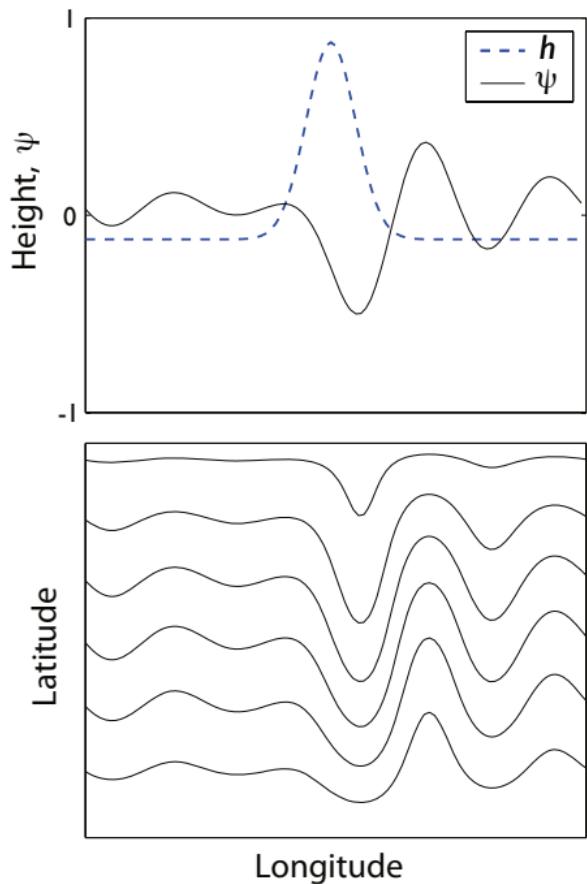


Fig. 16.11

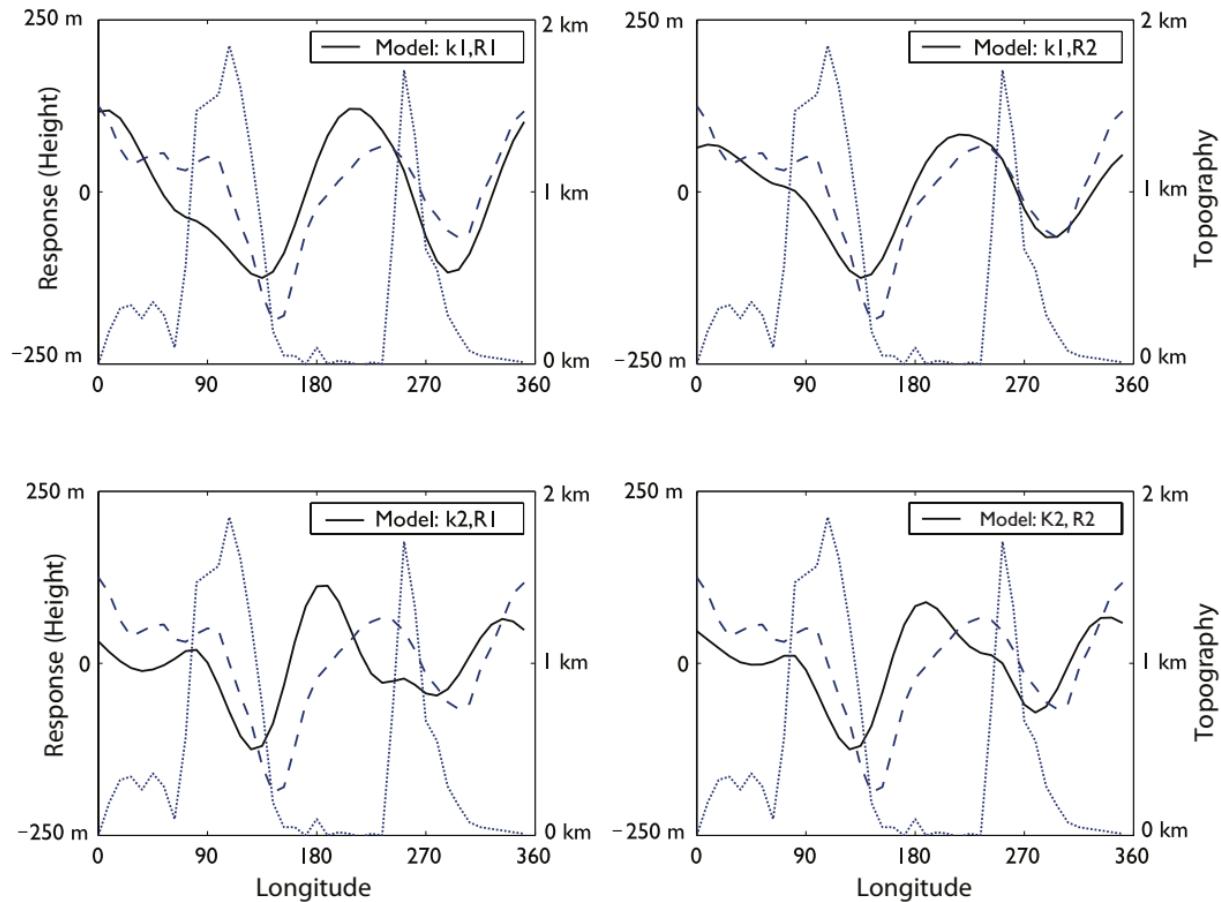


Fig. 16.12

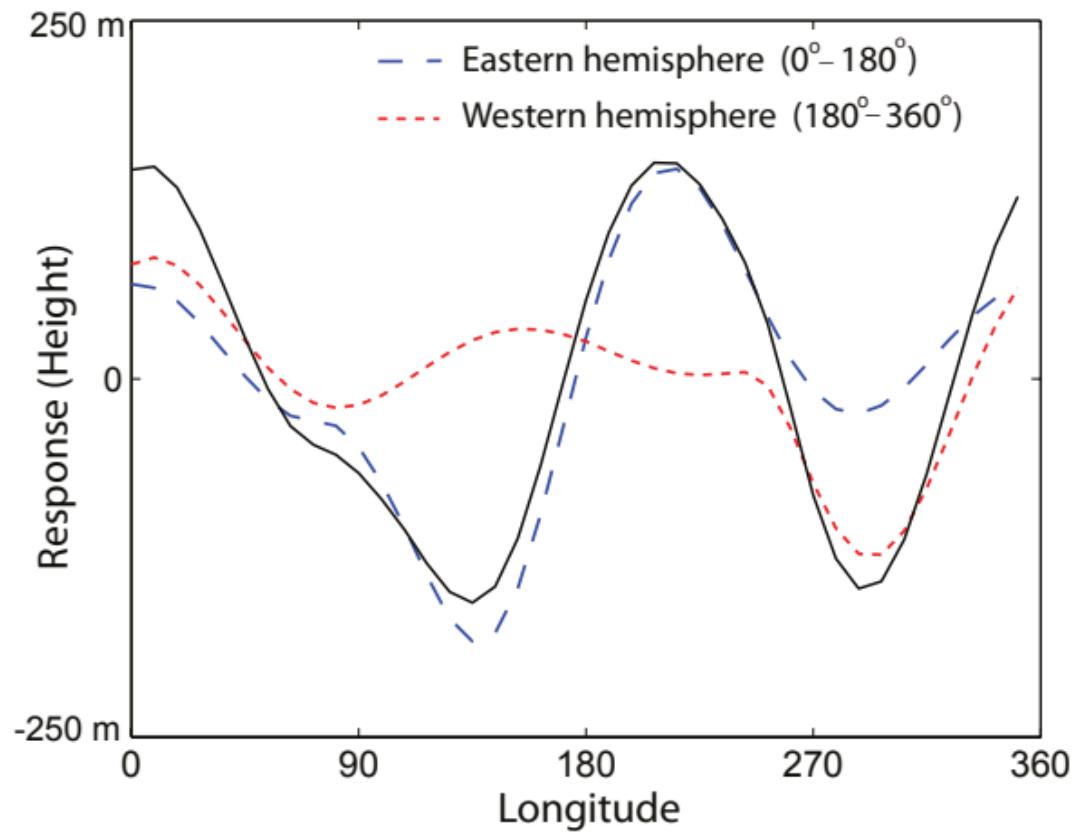


Fig. 16.13

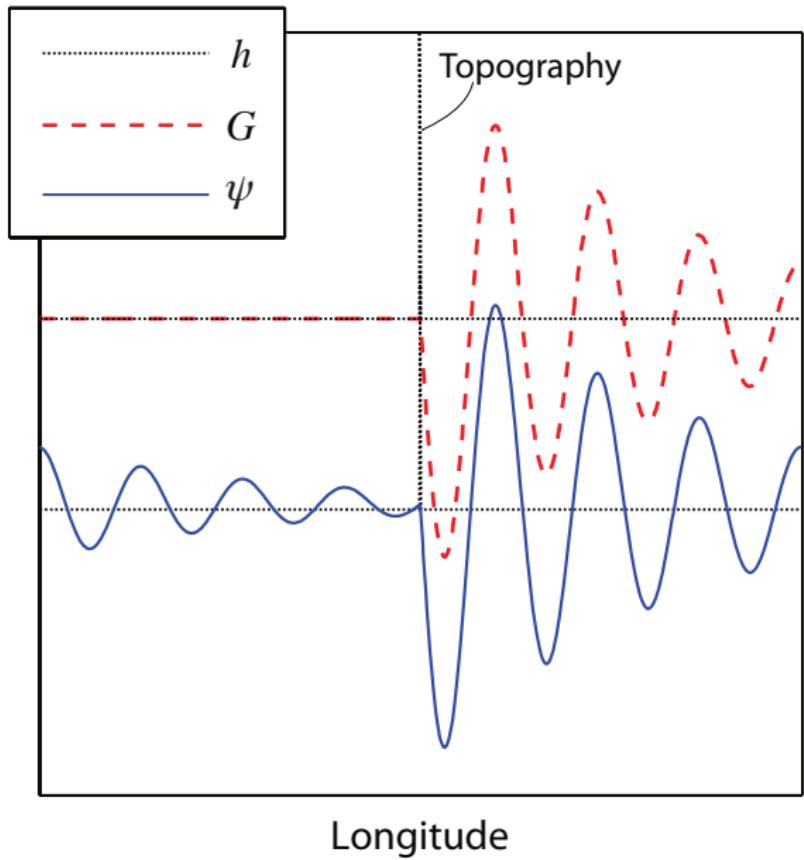
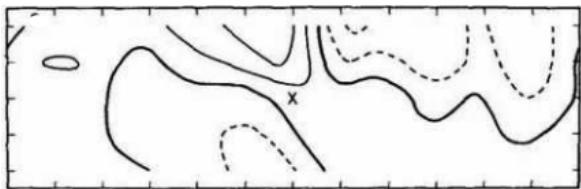
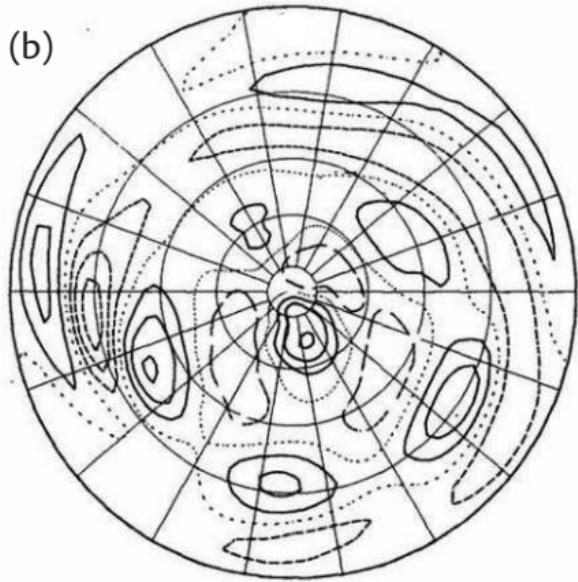


Fig. 16.14

(a)



(b)



(c)

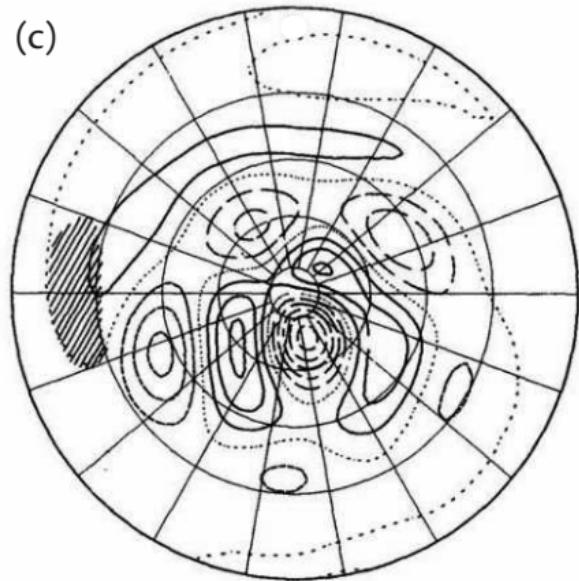


Fig. 16.15

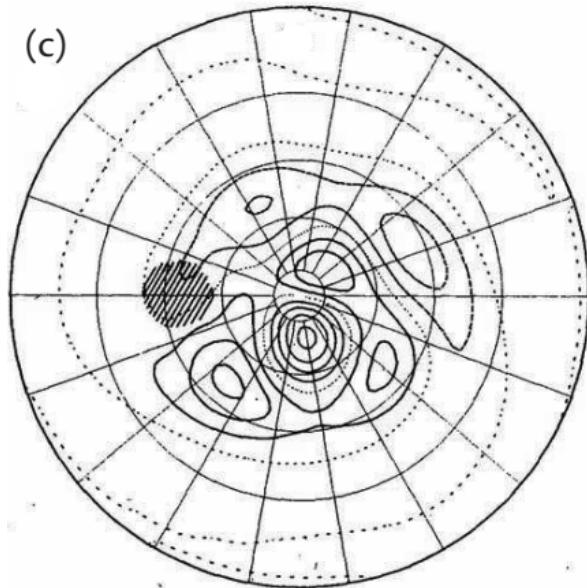
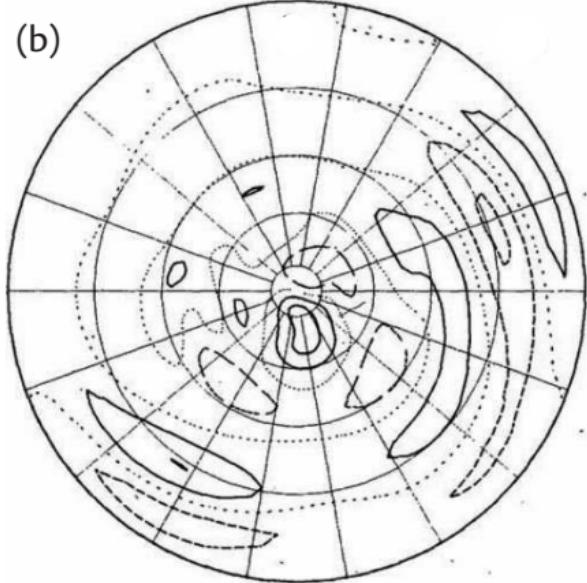
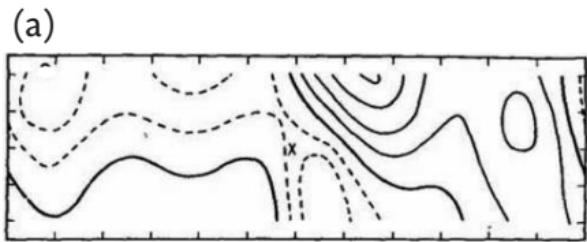
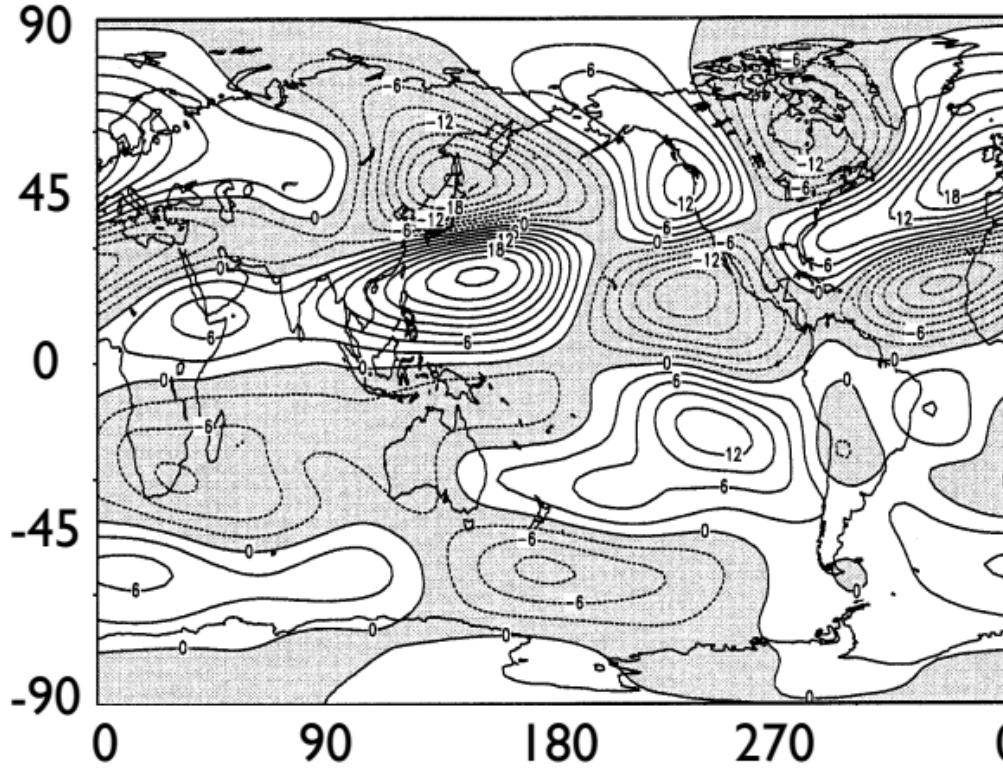


Fig. 16.16

Observed



Linear Theory

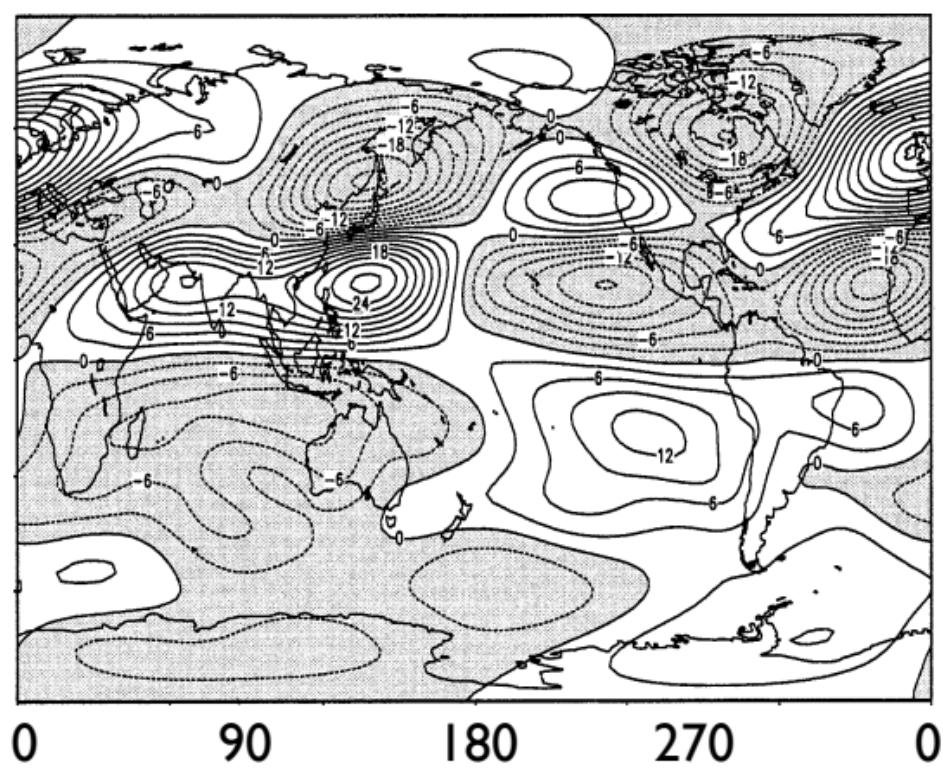


Fig. 16.17

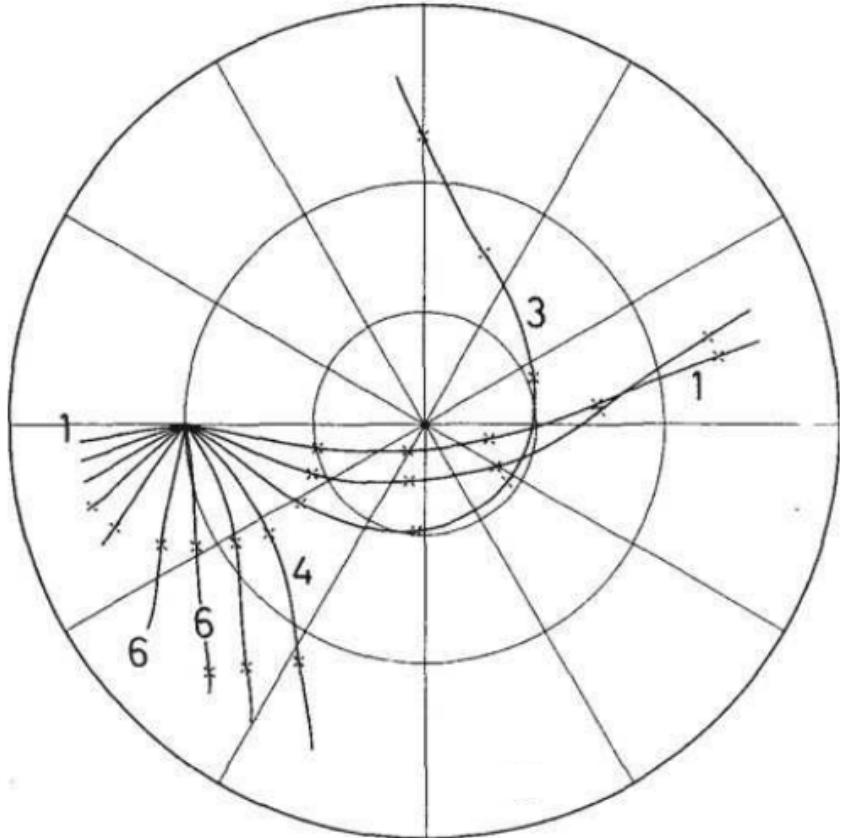


Fig. 16.18

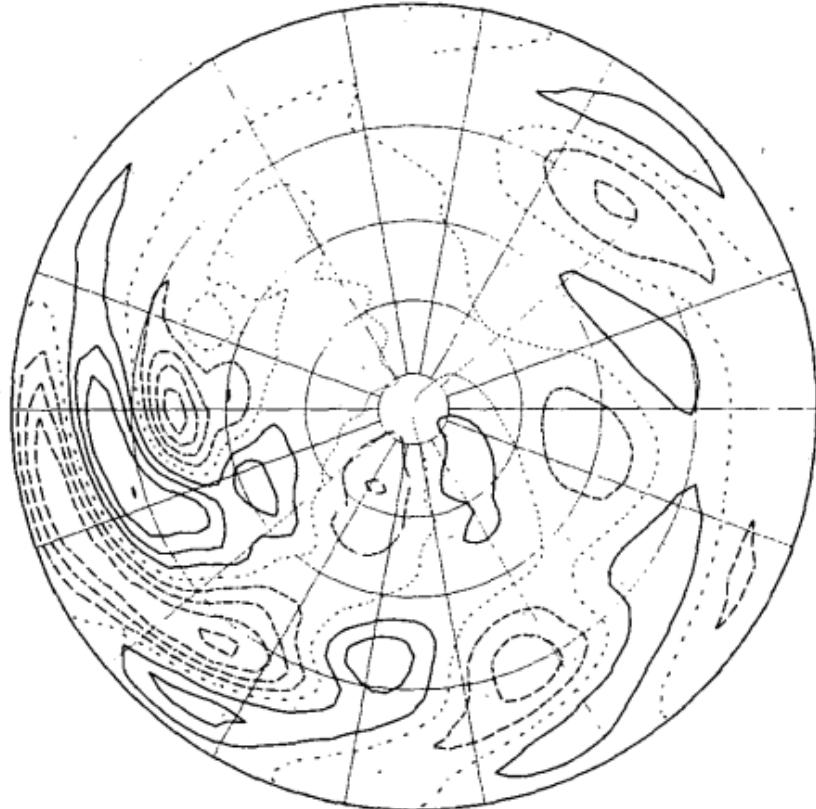
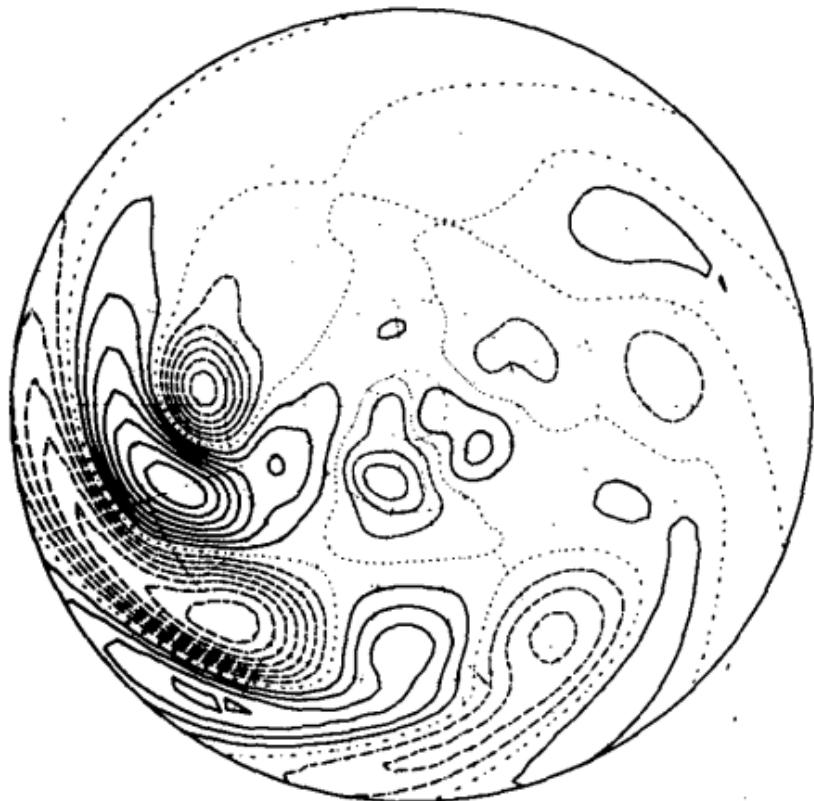


Fig. 16.19

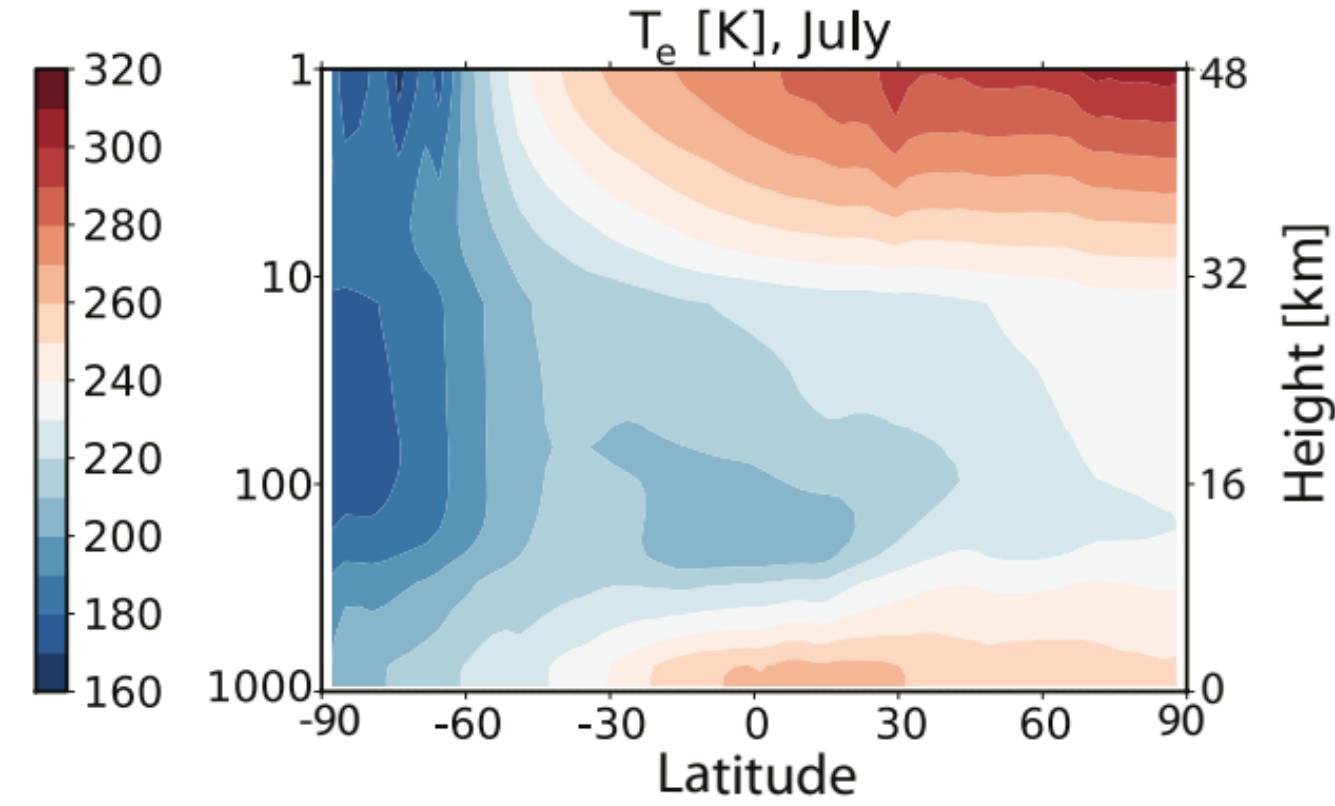
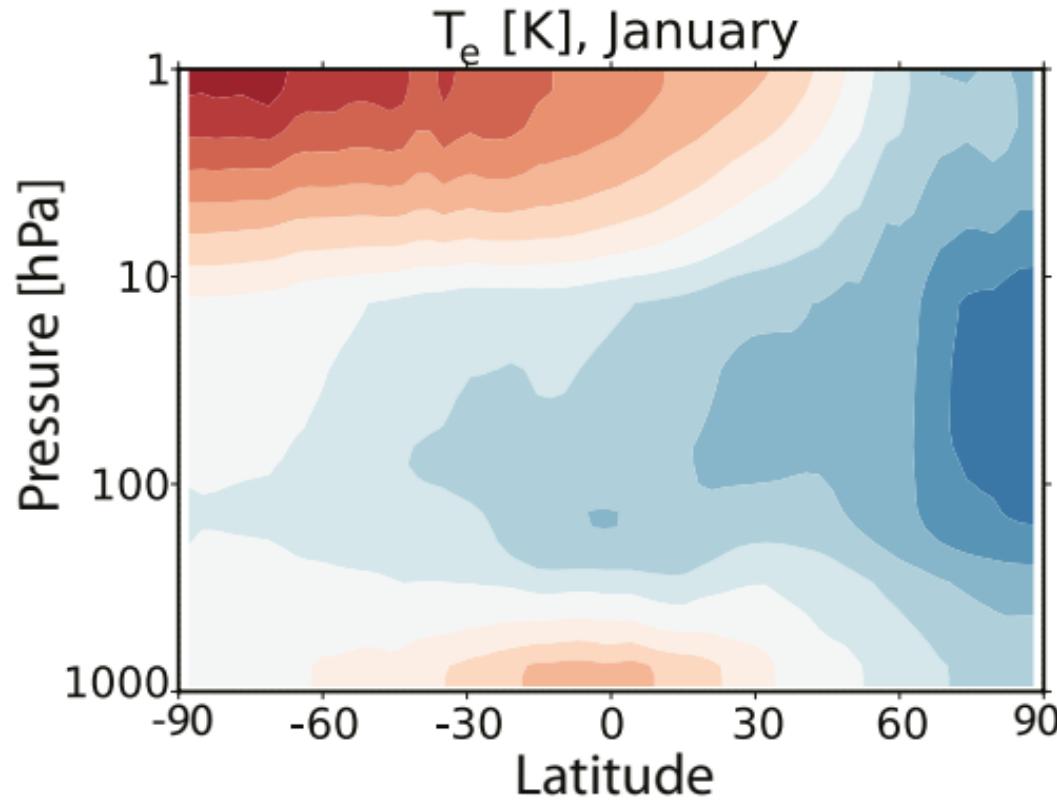


Fig. 17.1

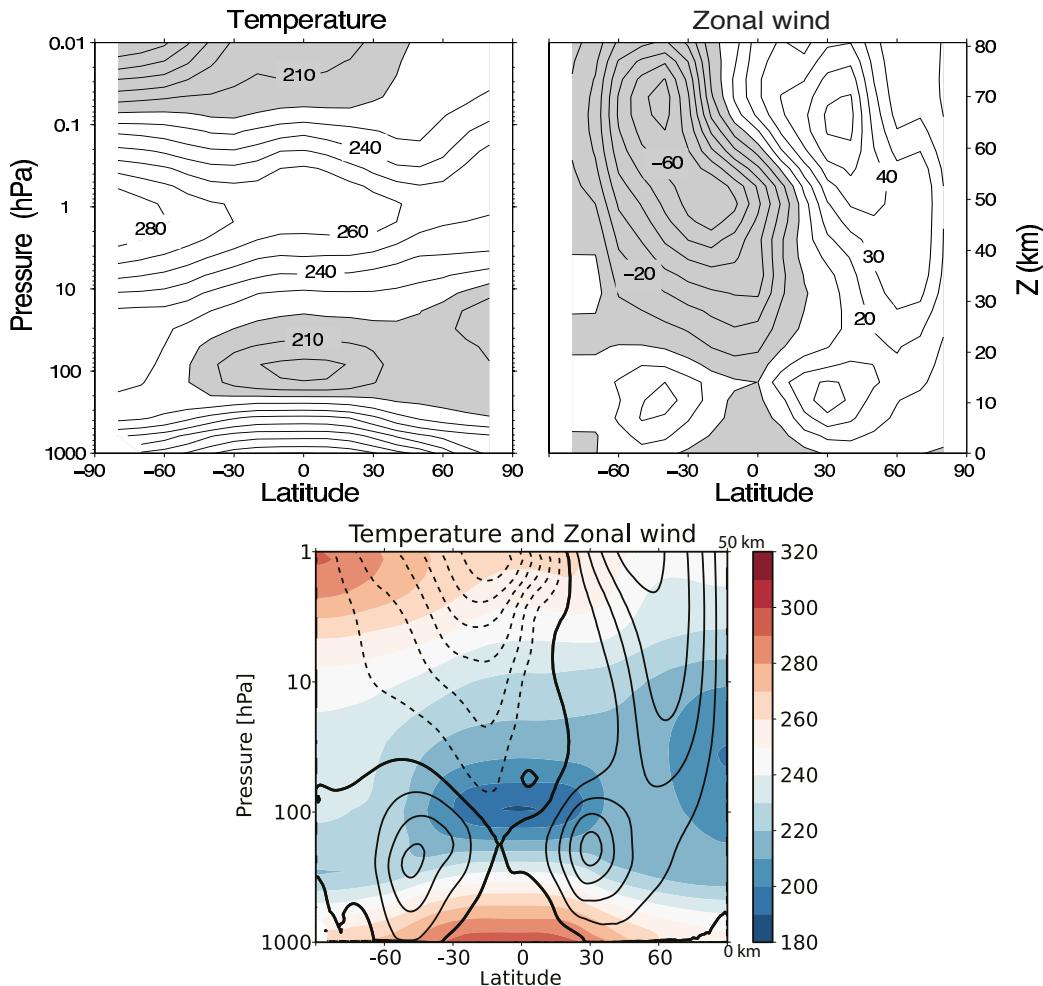
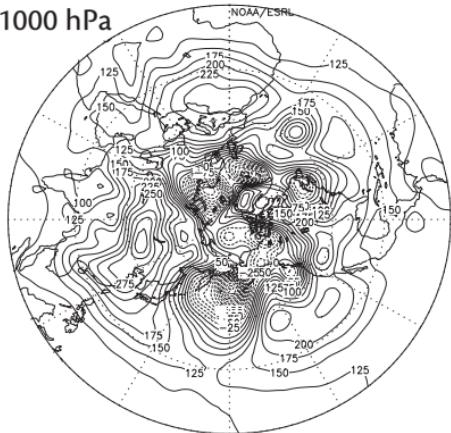
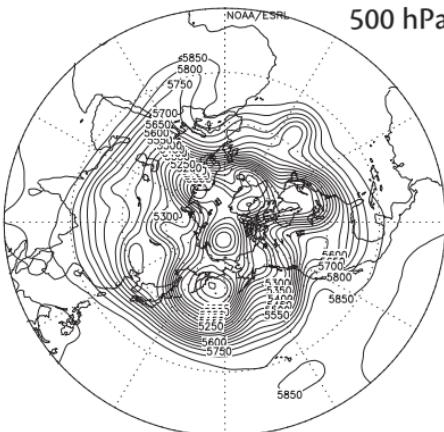


Fig. 17.2

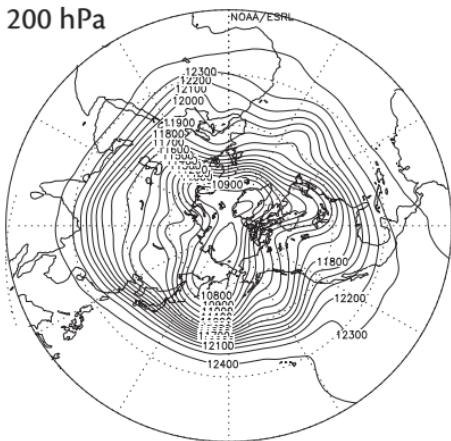
1000 hPa



500 hPa



200 hPa



20 hPa

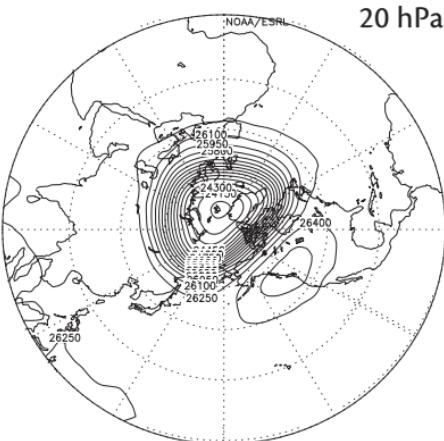


Fig. 17.3

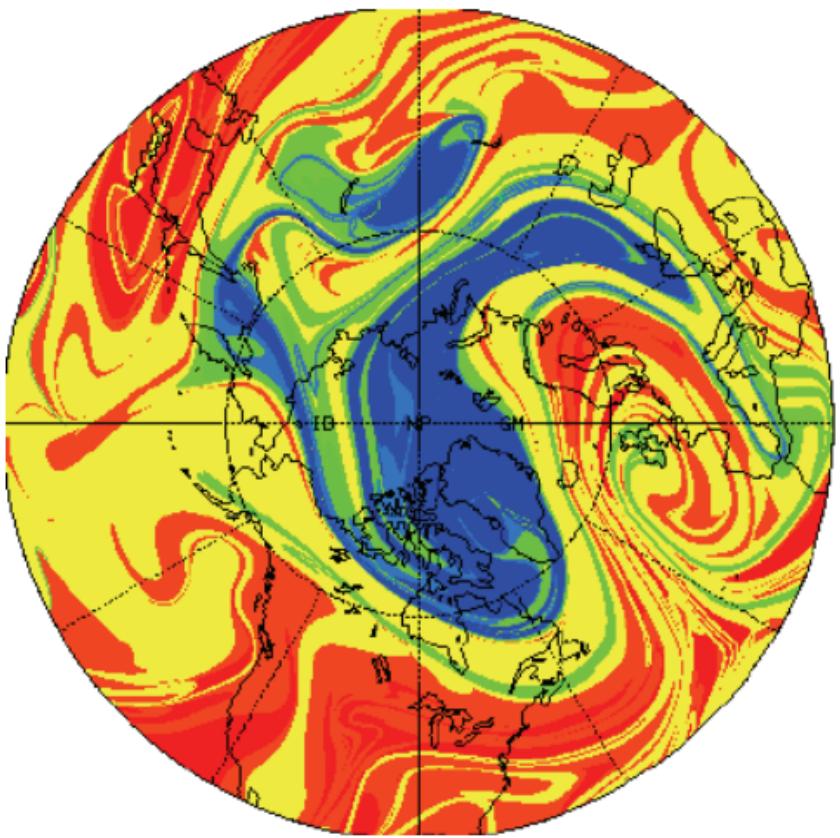


Fig. 17.4

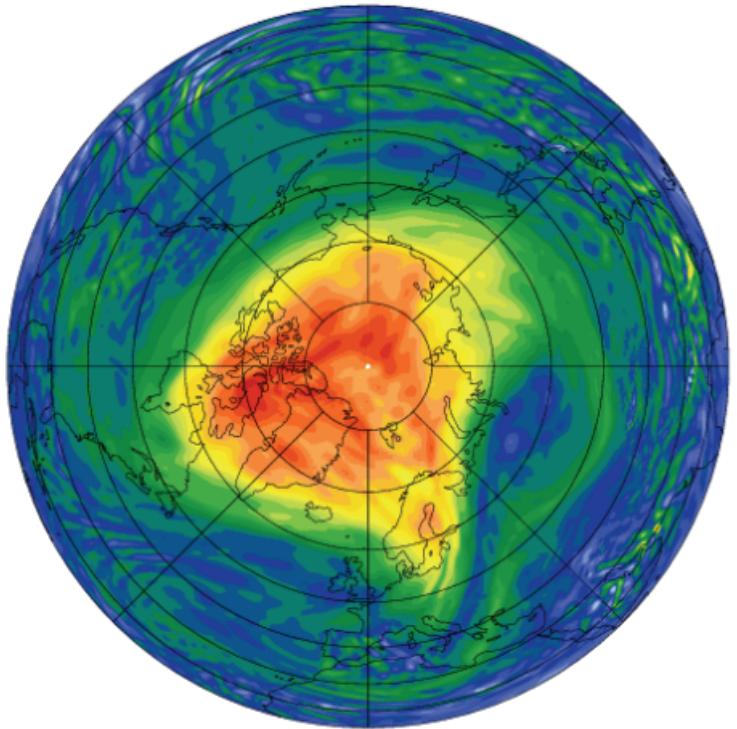
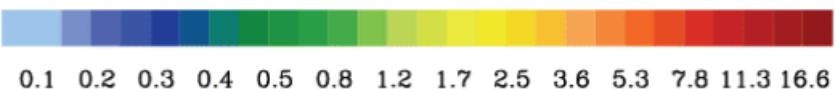
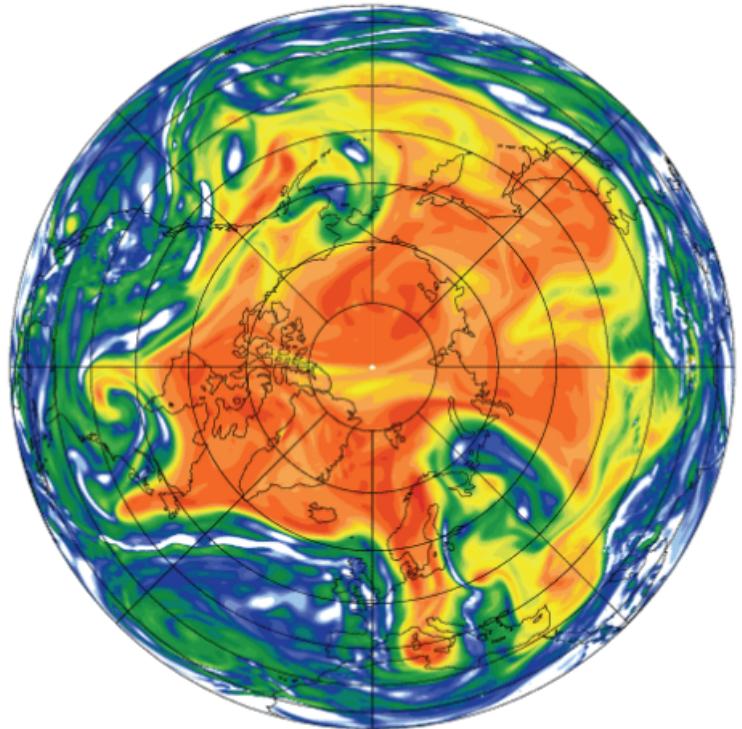


Fig. 17.5

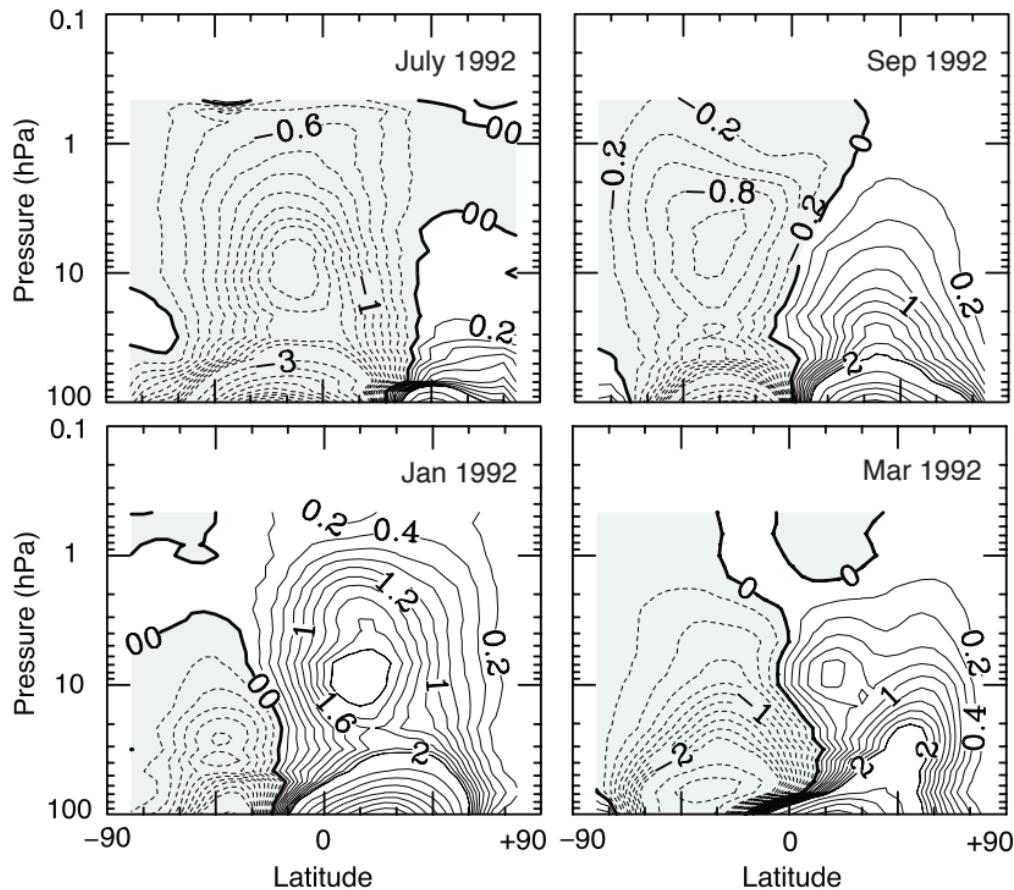


Fig. 17.6

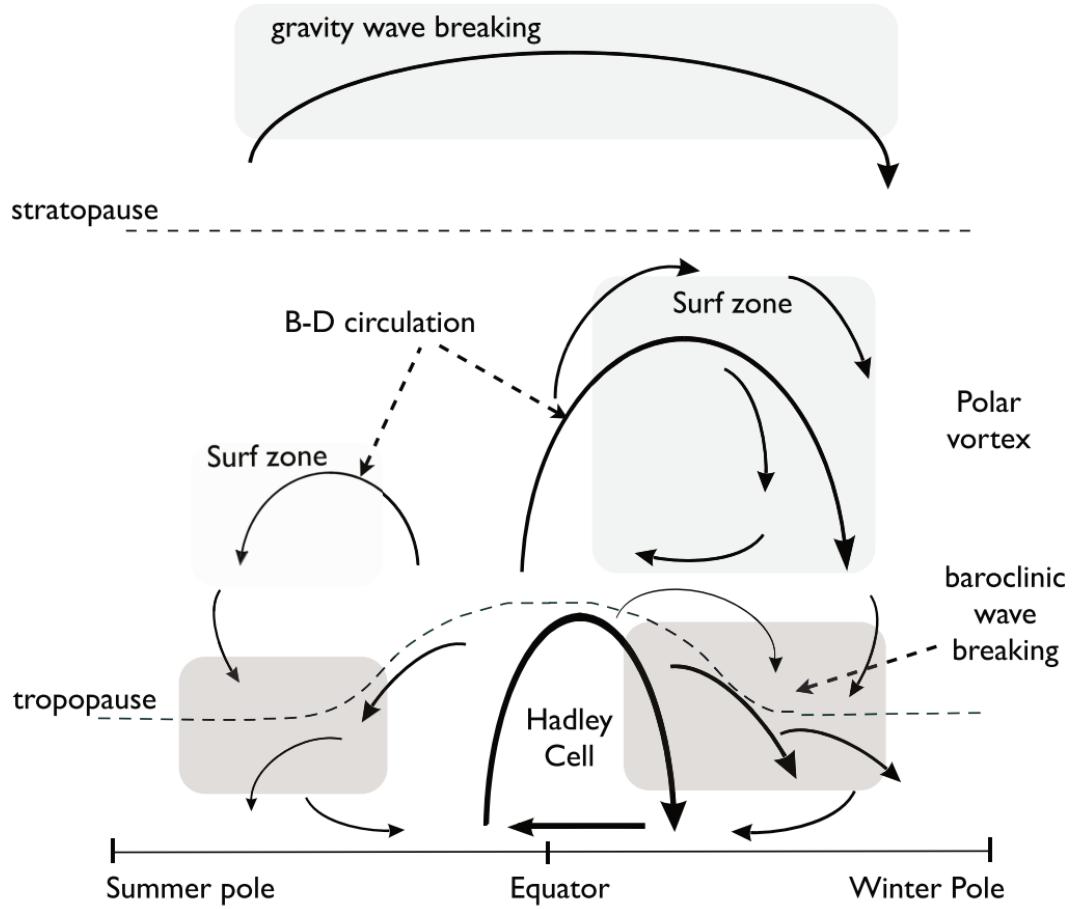


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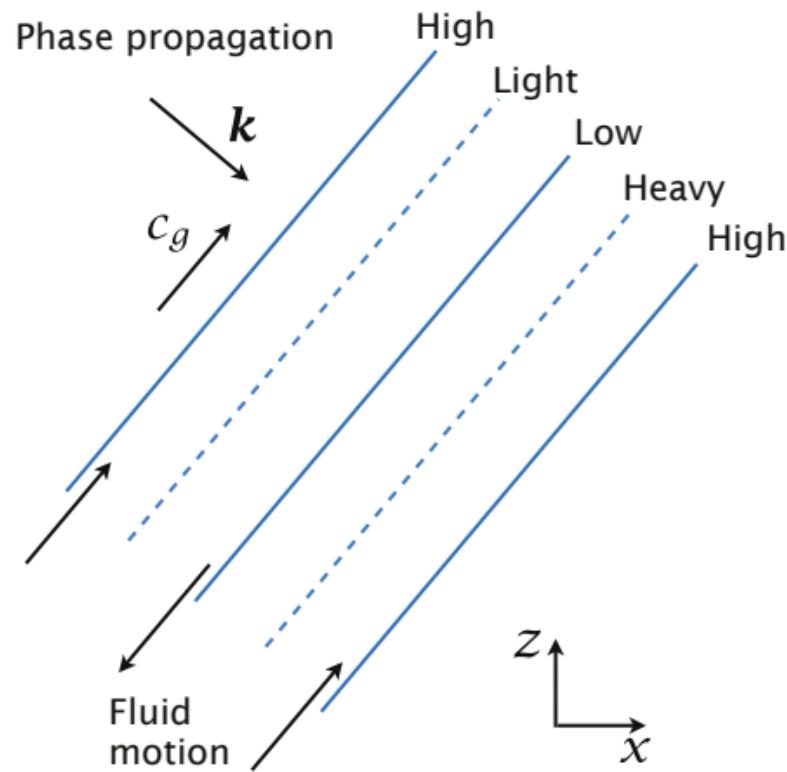
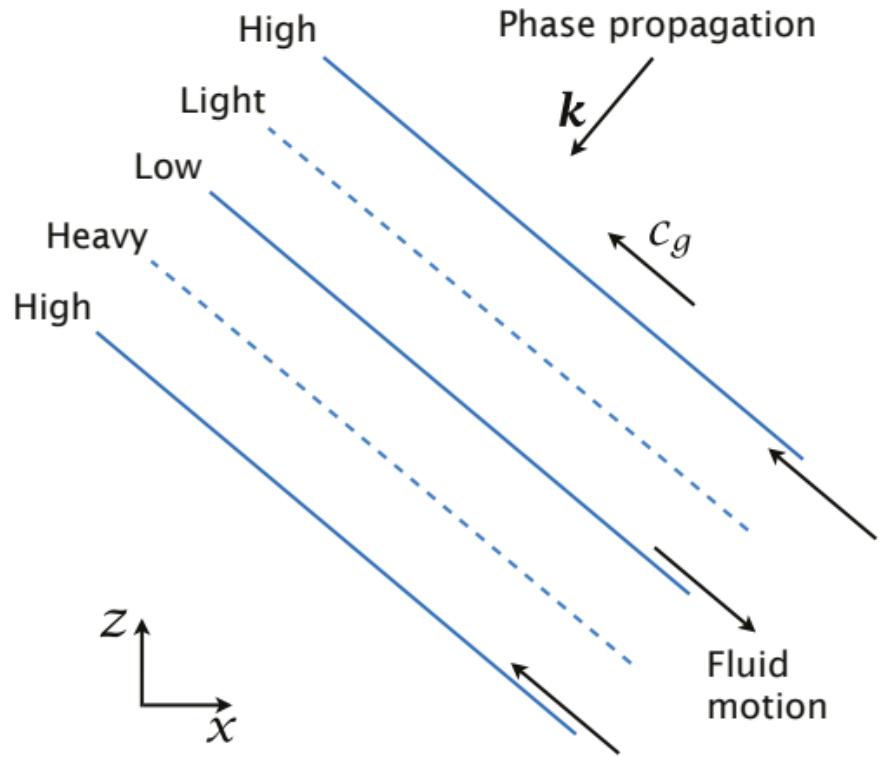


Fig. 17.8

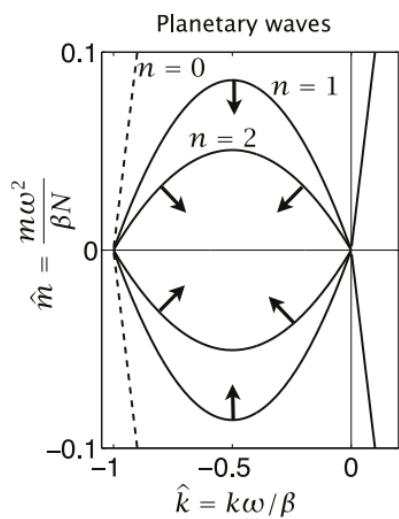
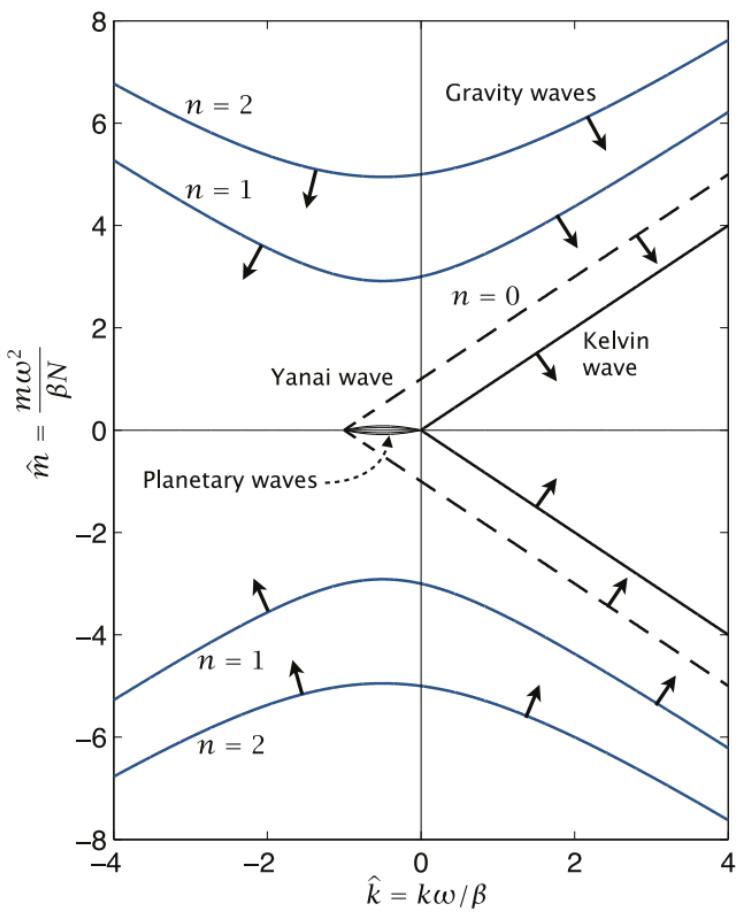


Fig. 17.9

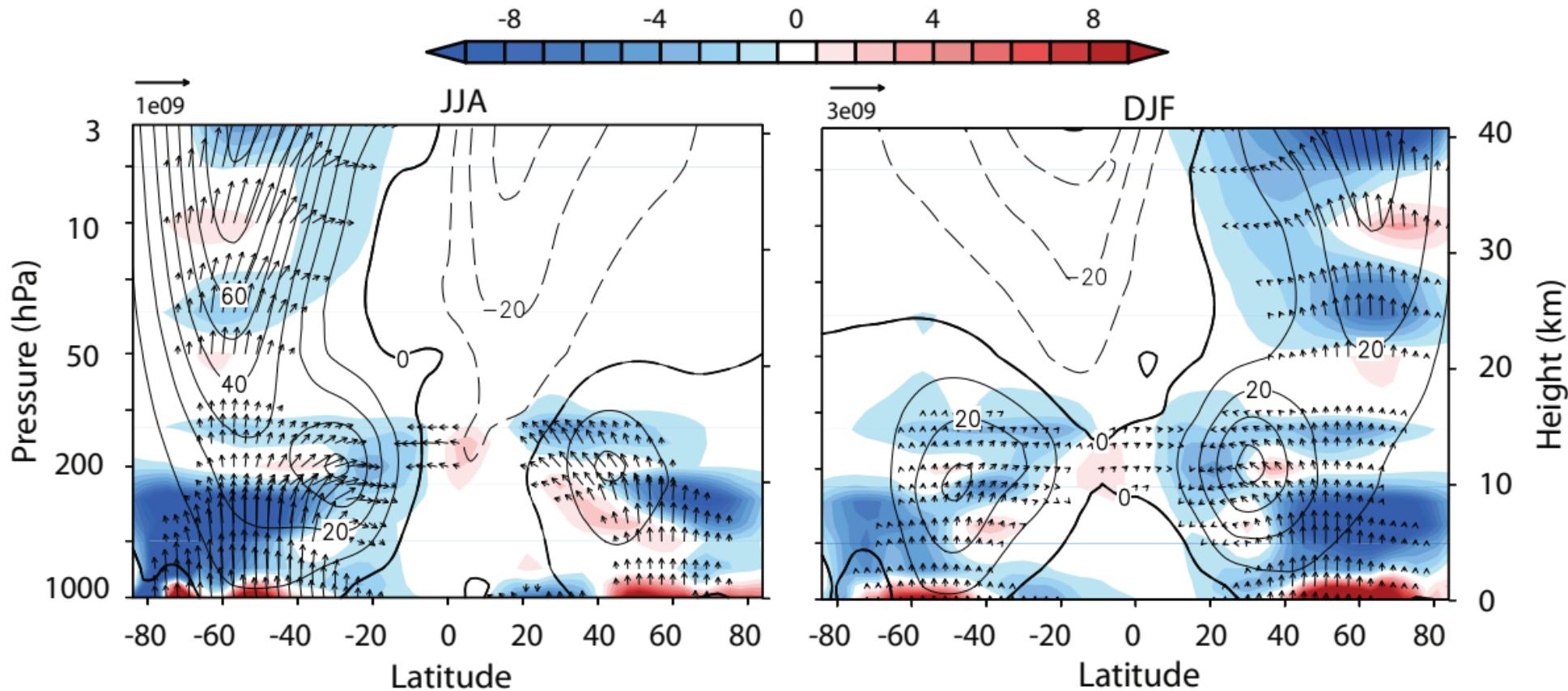


Fig. 17.10

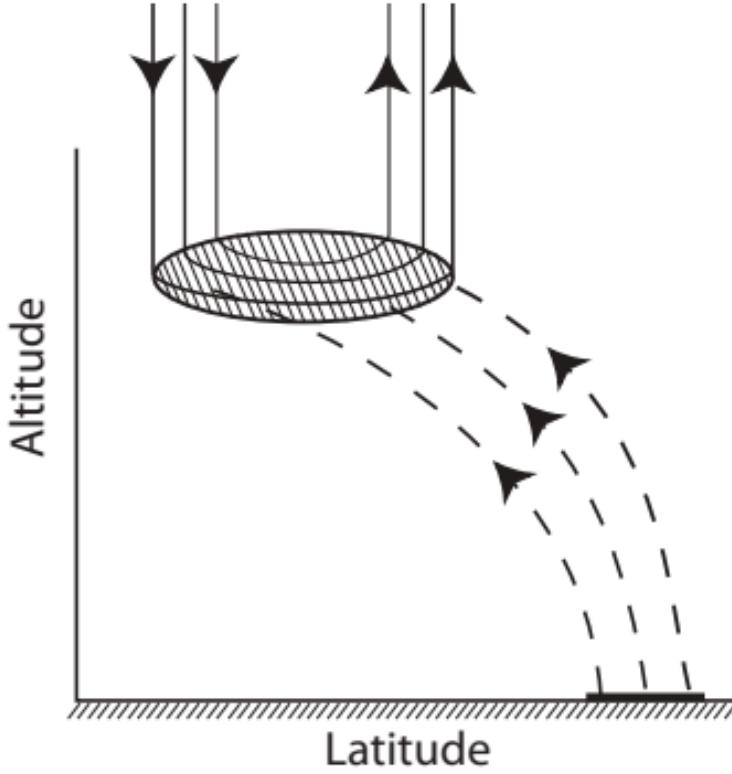
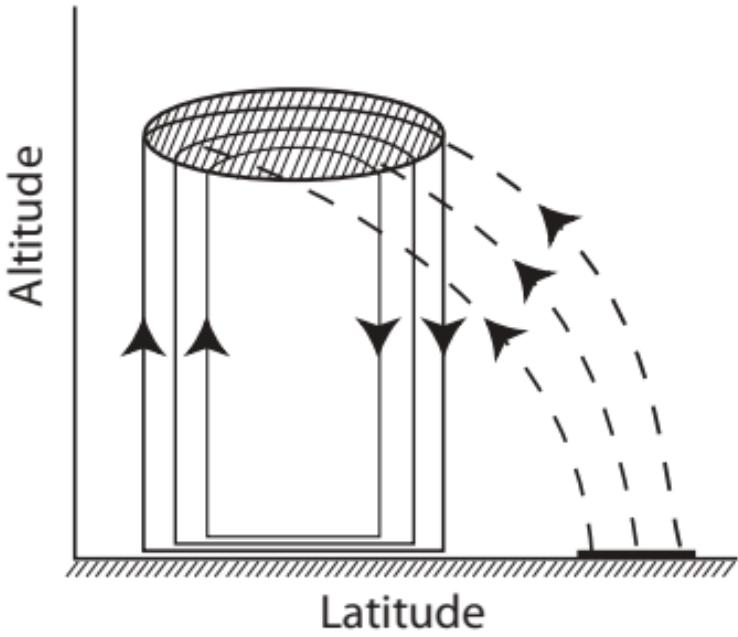


Fig. 17.11

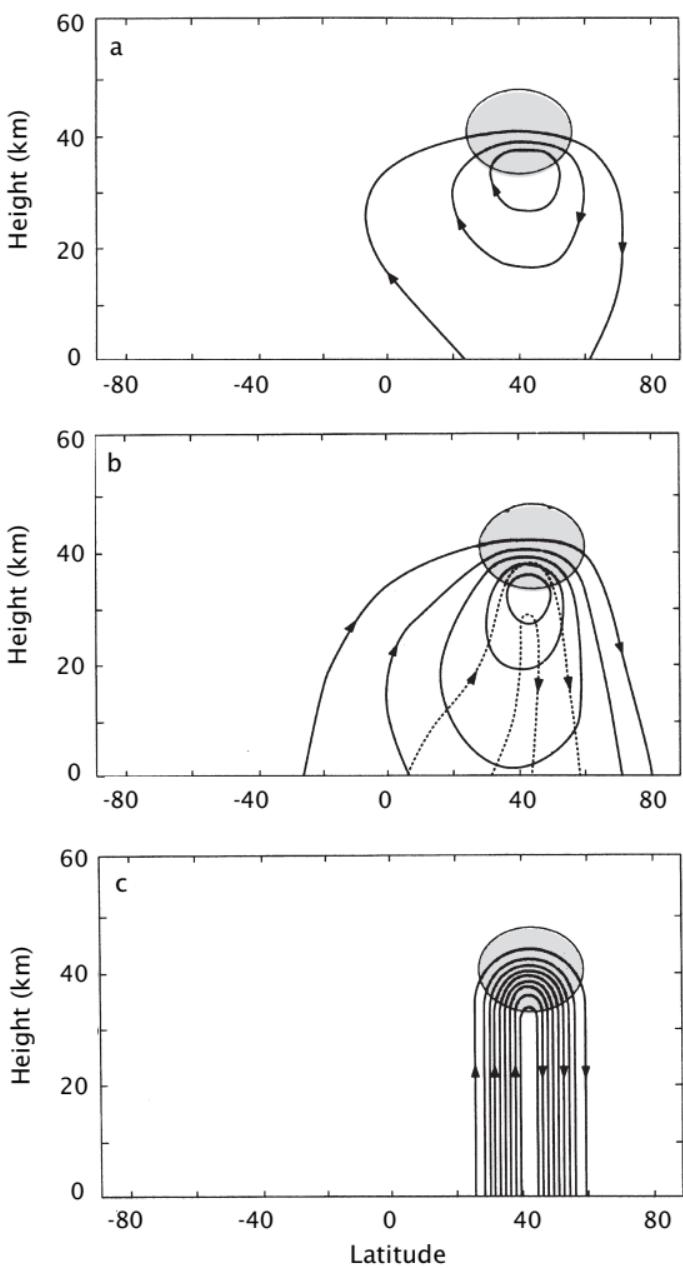


Fig. 17.12

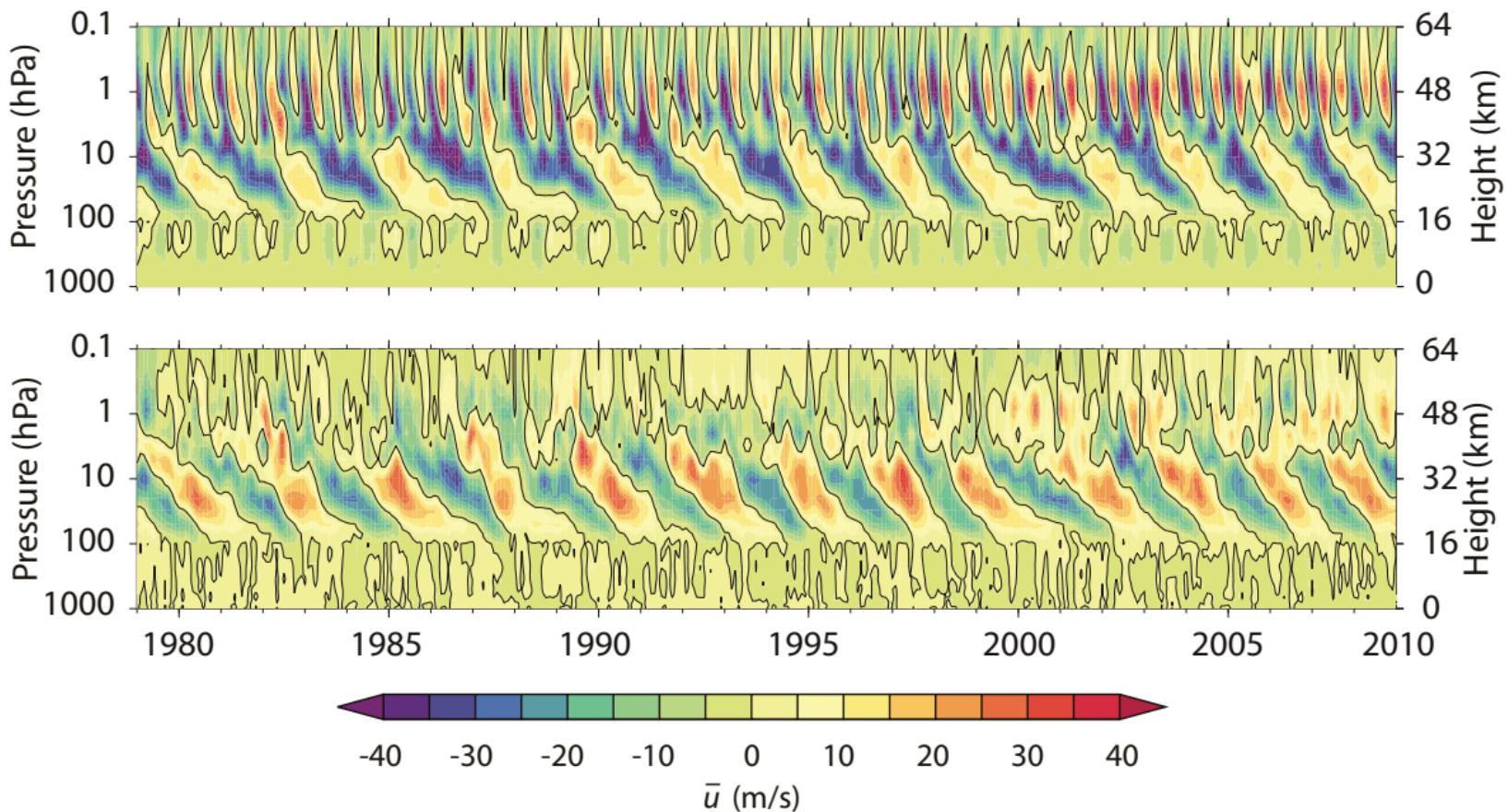


Fig. 17.13

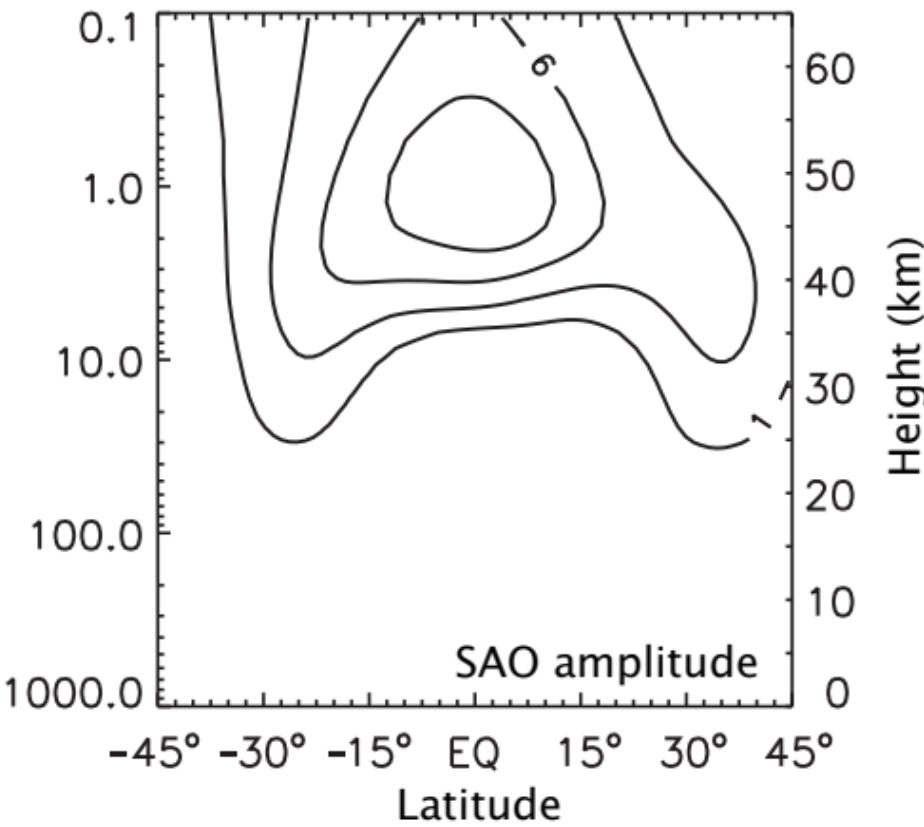
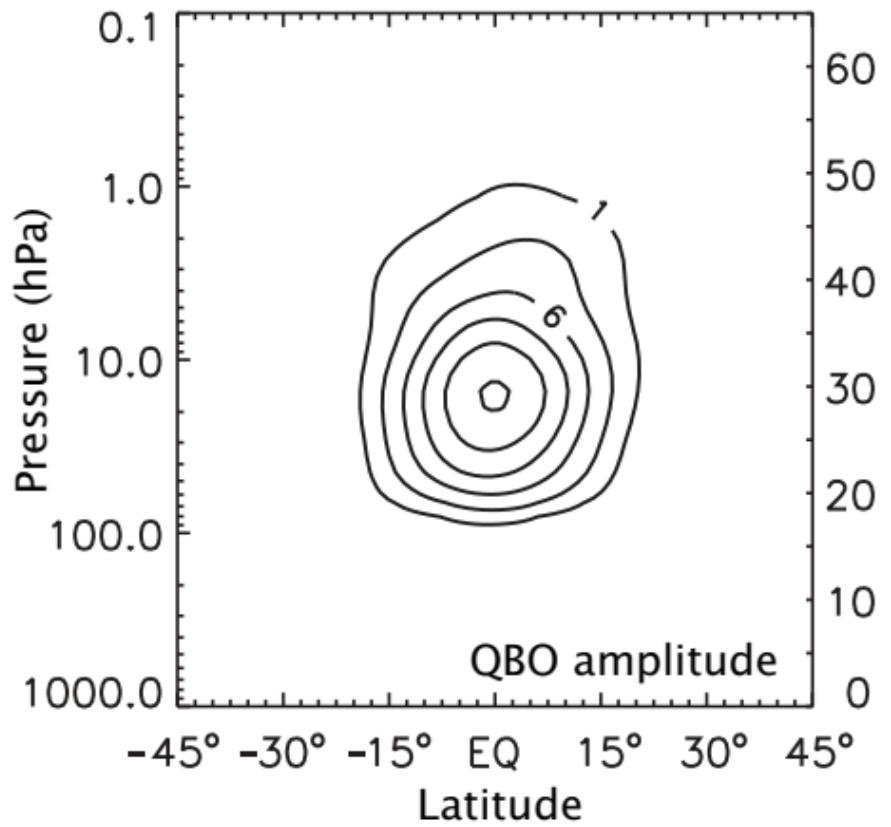


Fig. 17.14

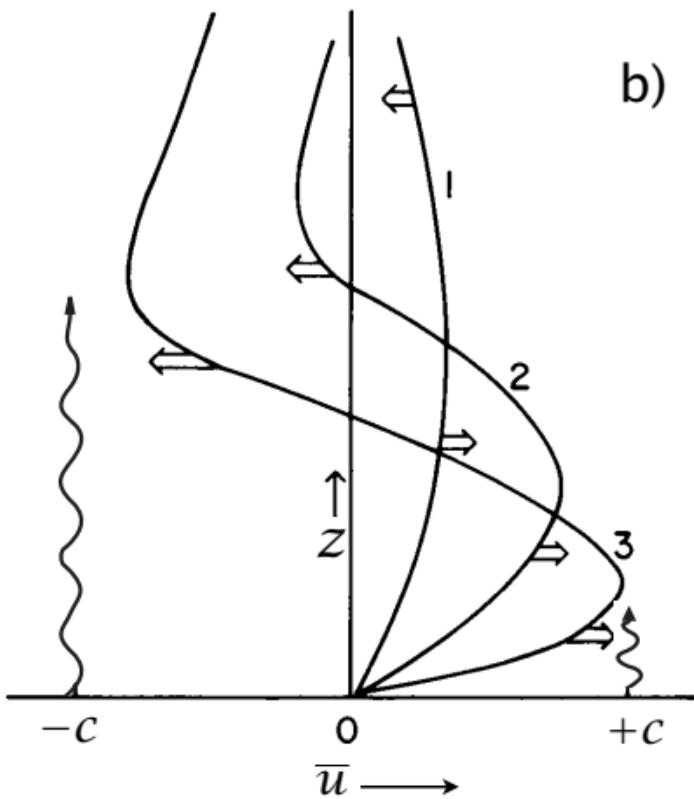
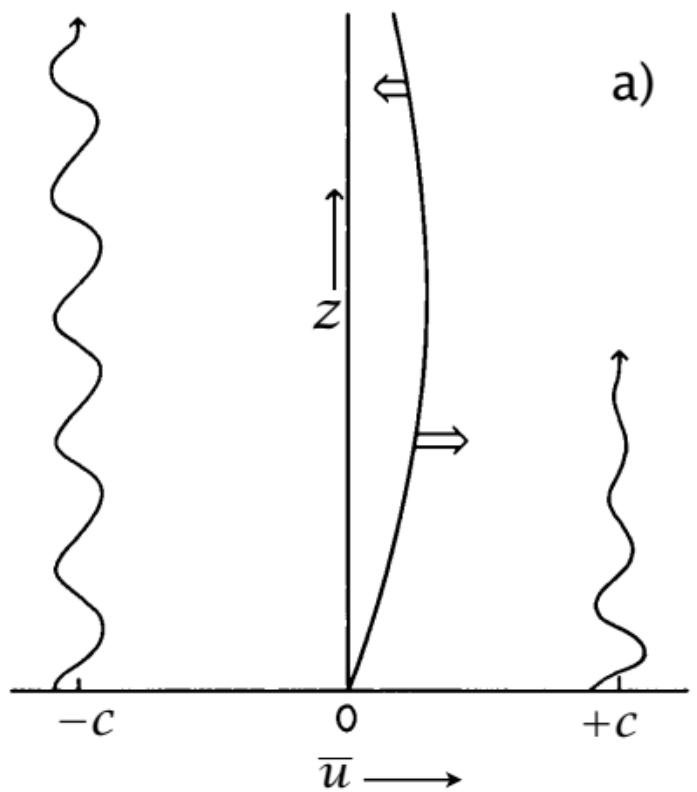


Fig. 17.15

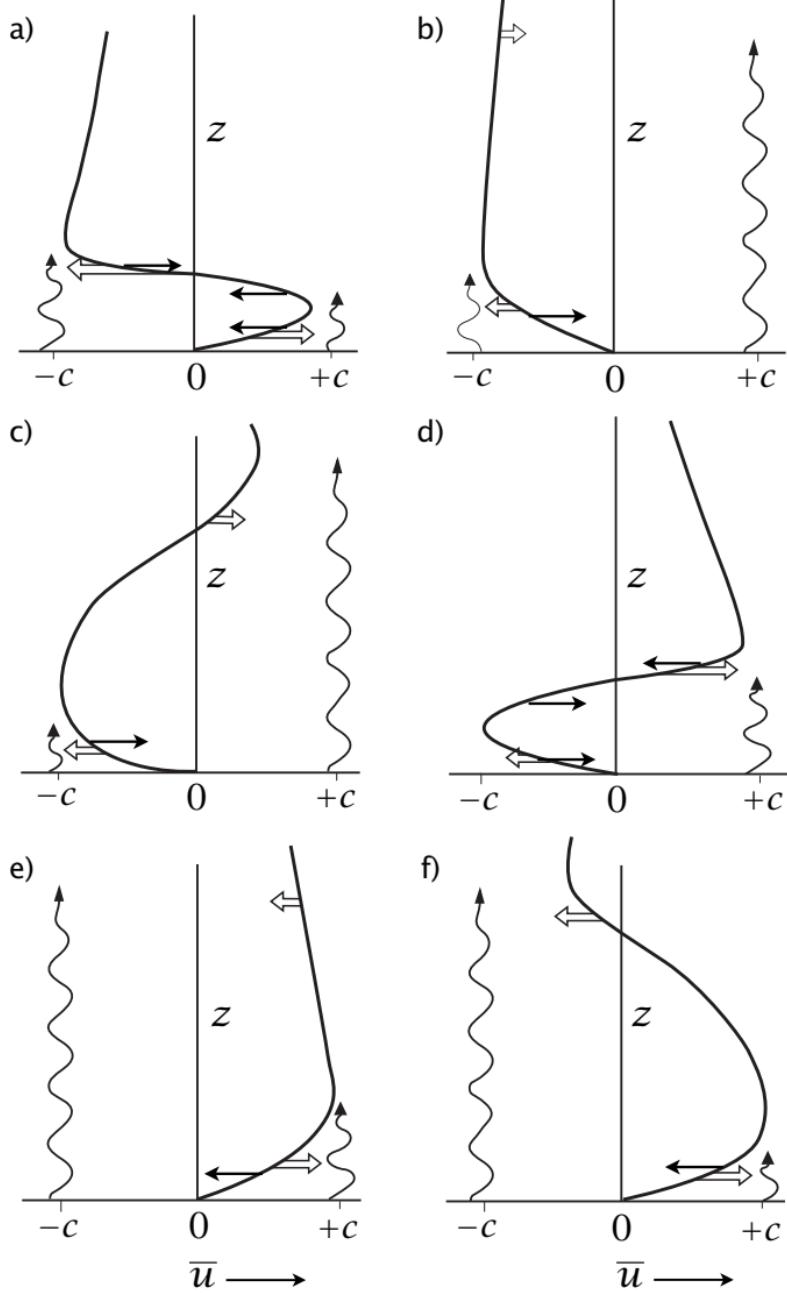


Fig. 17.16

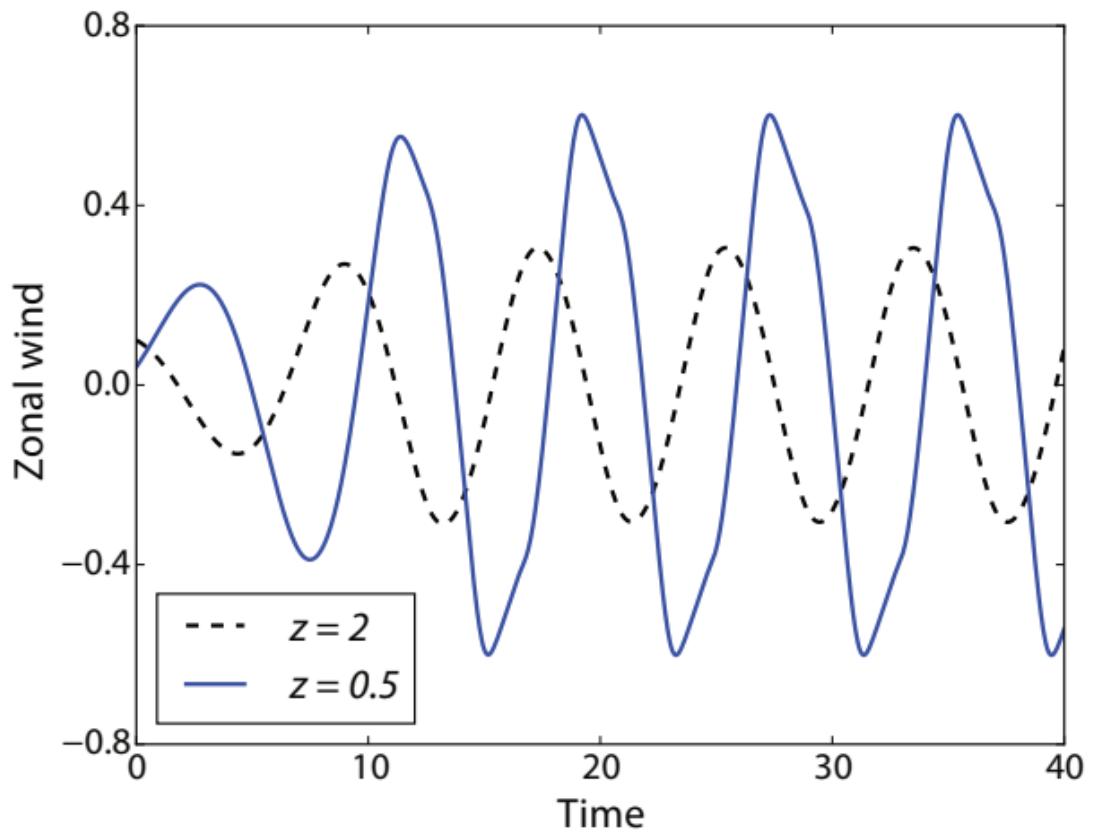


Fig. 17.17

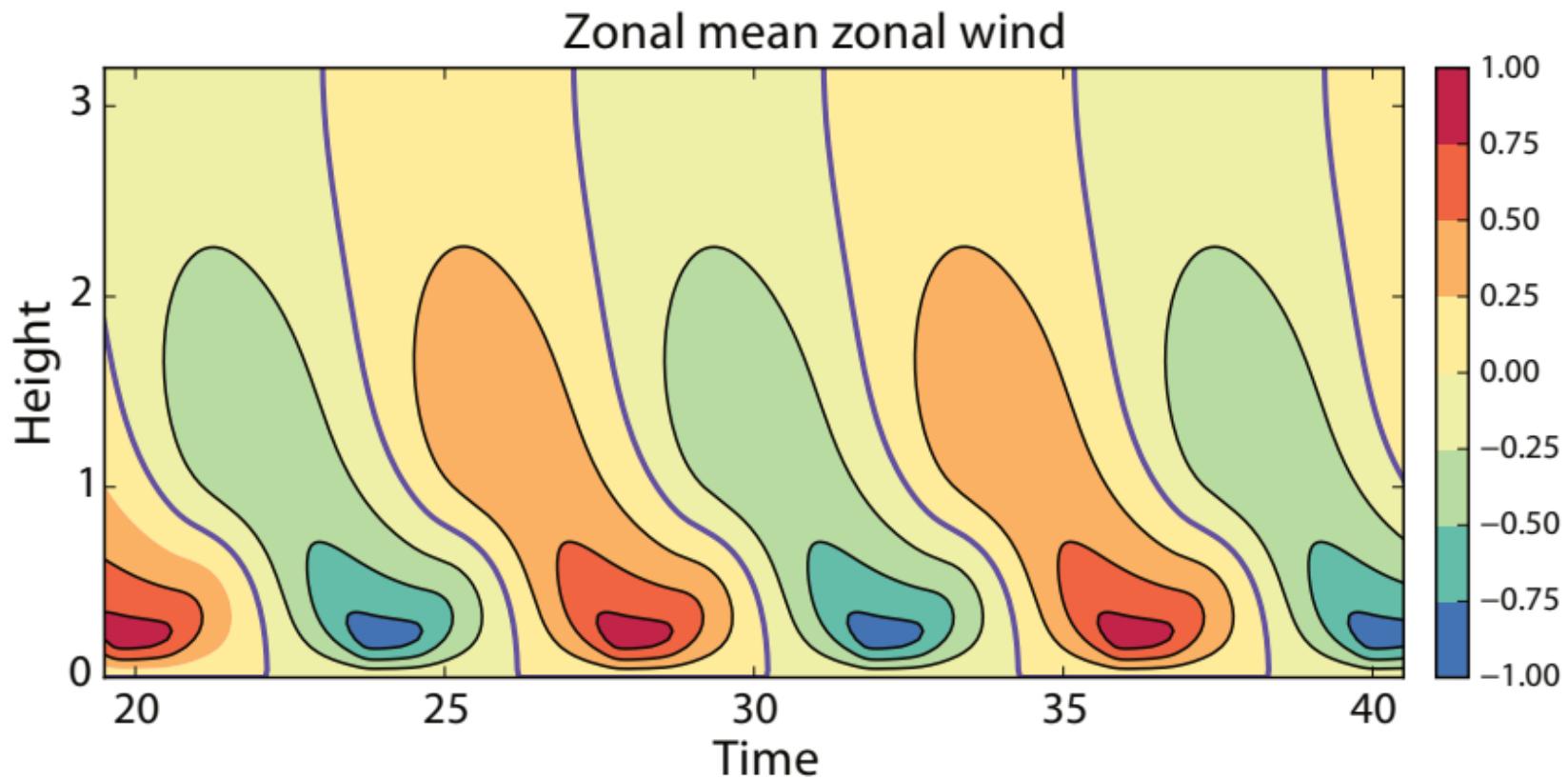


Fig. 17.18

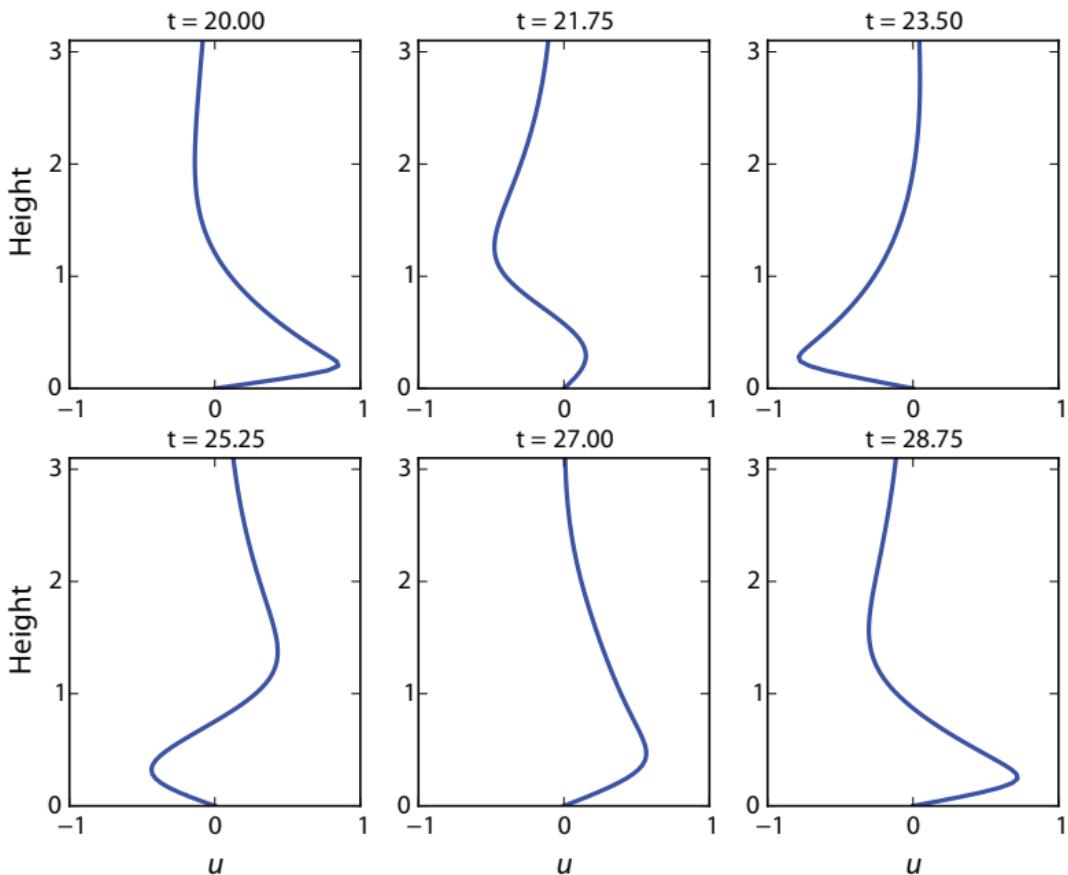


Fig. 17.19

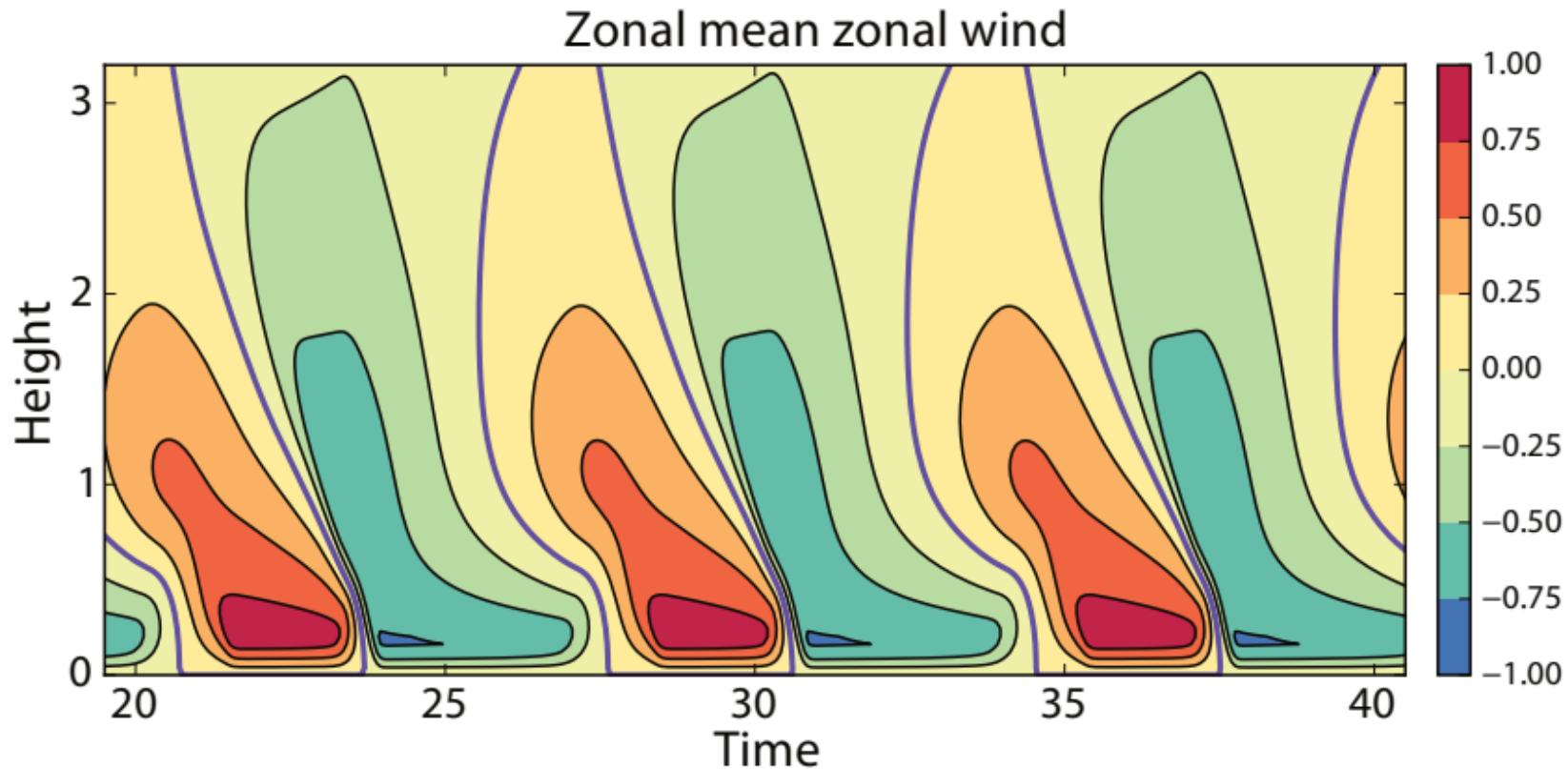


Fig. 17.20

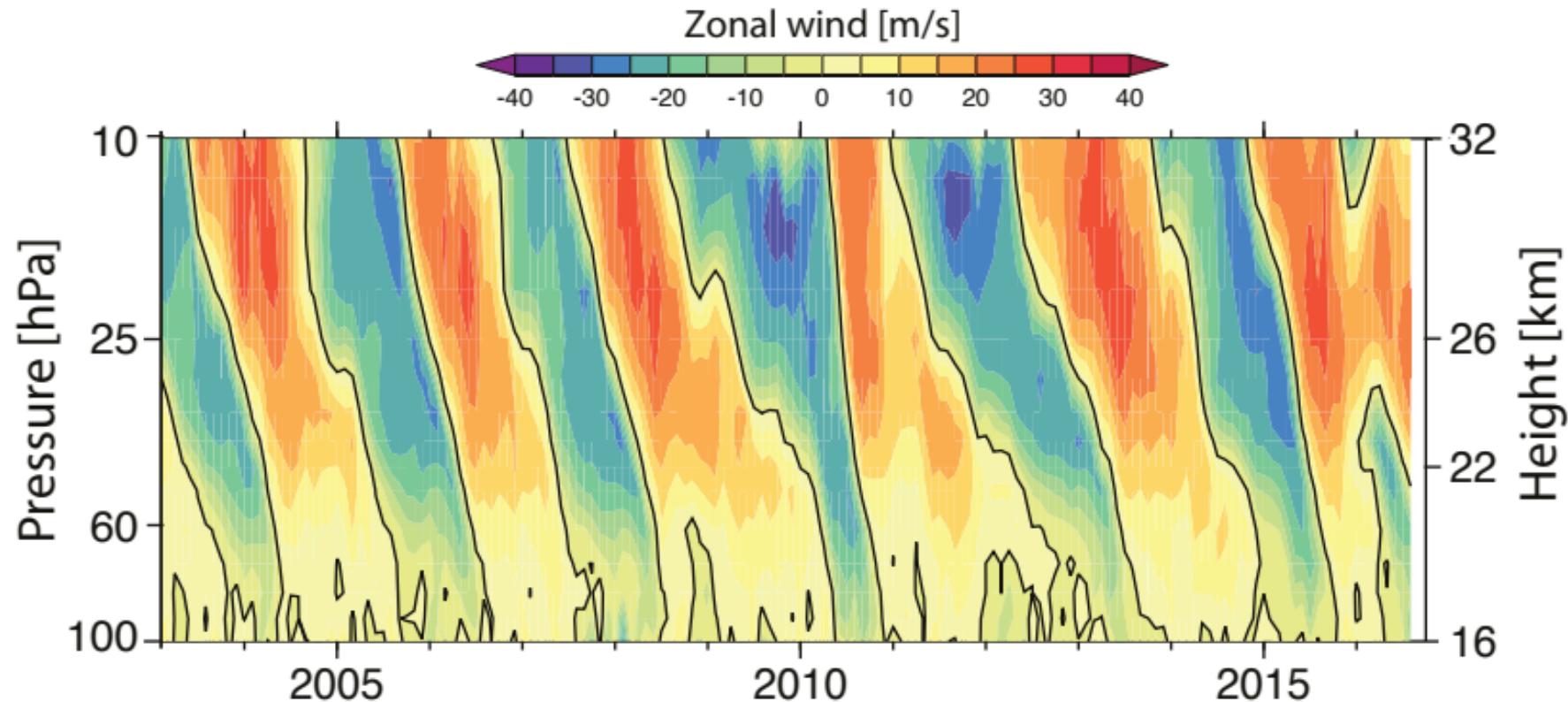


Fig. 17.21

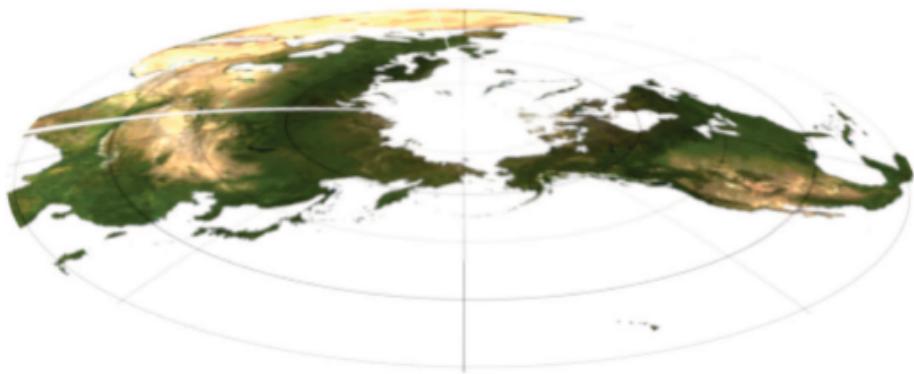
850



850



400



400

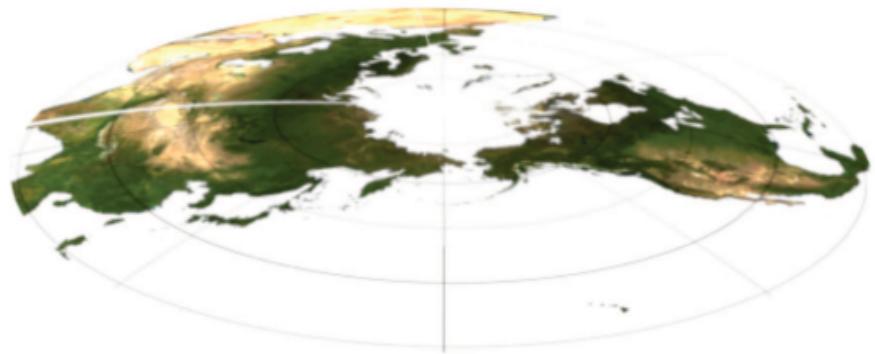


Fig. 17.22

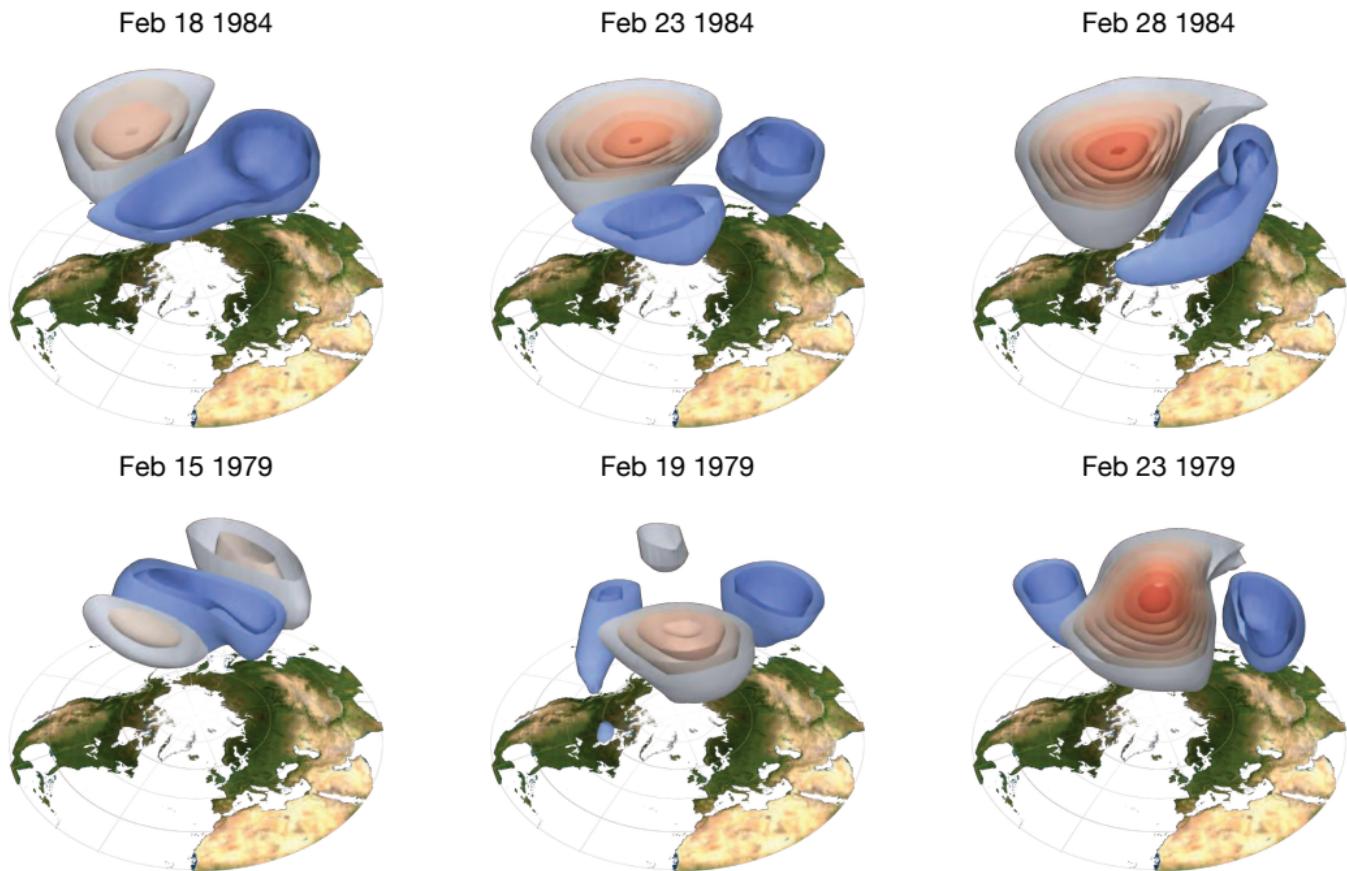


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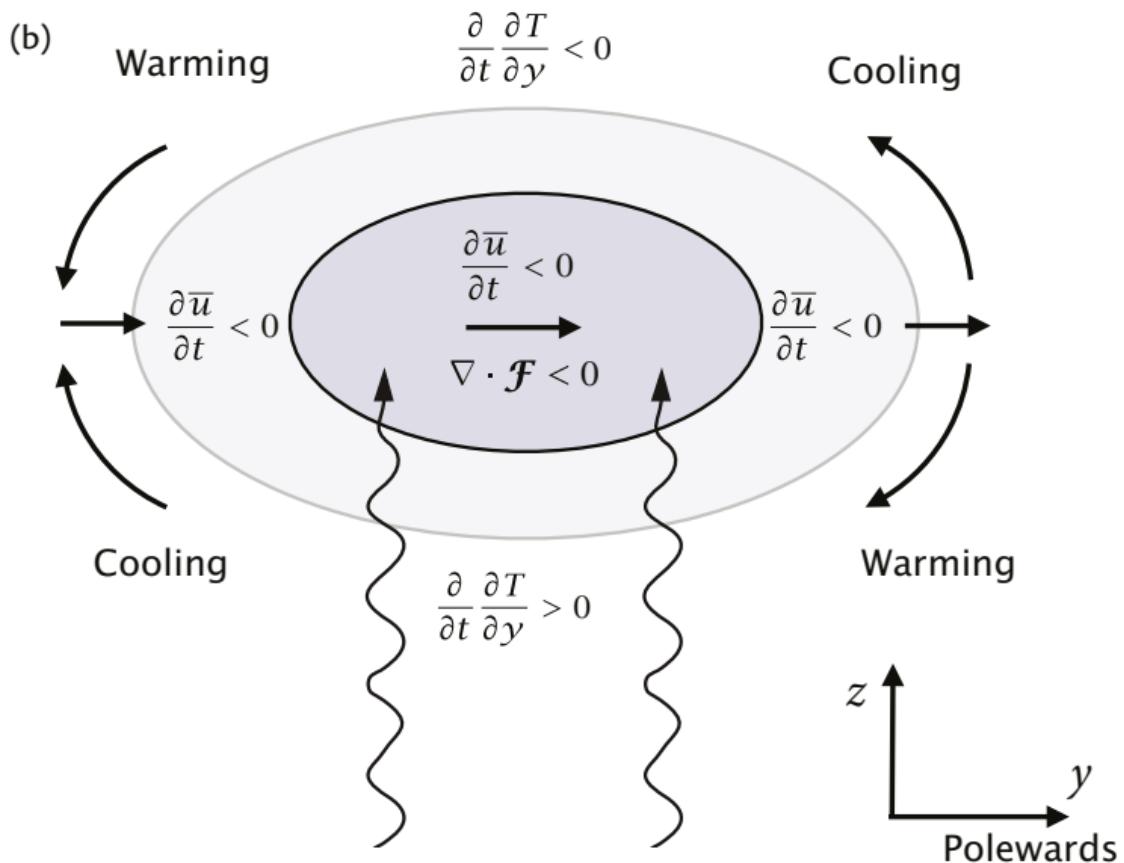
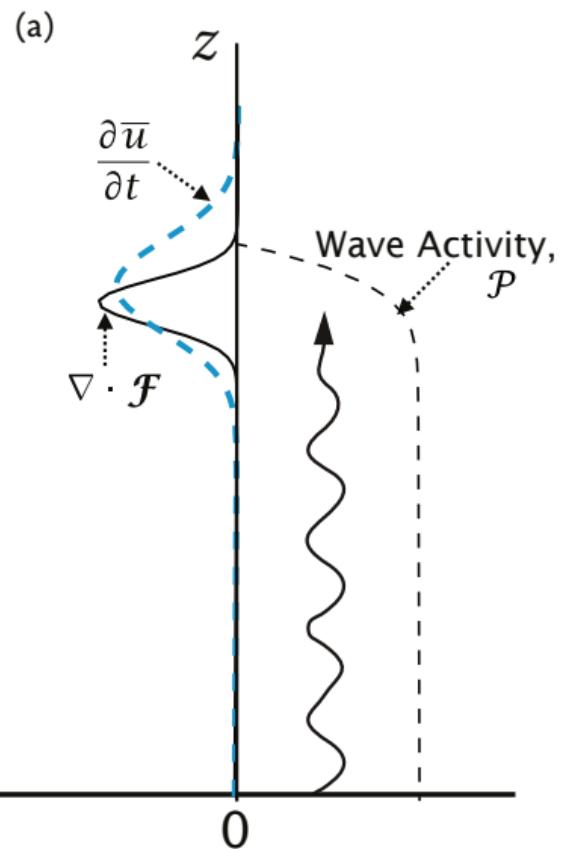


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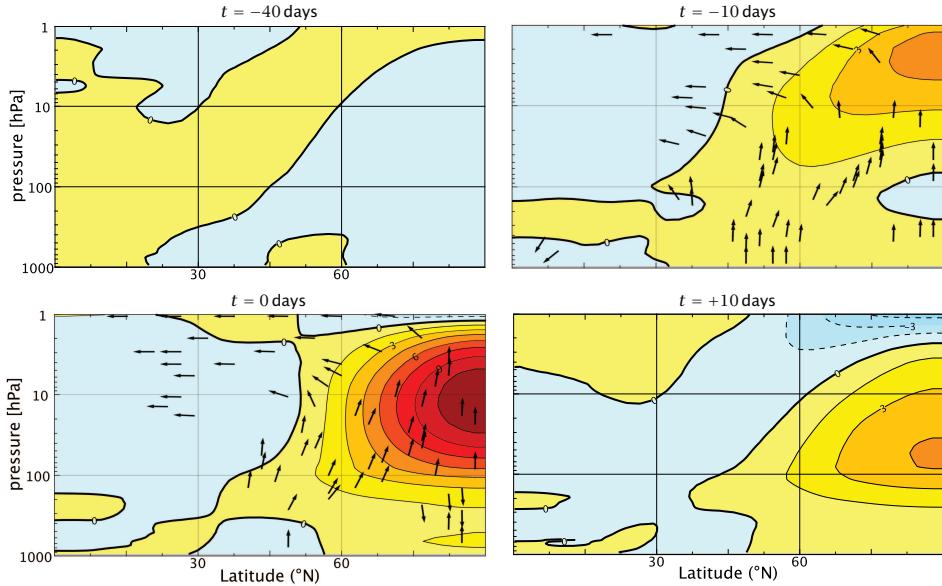
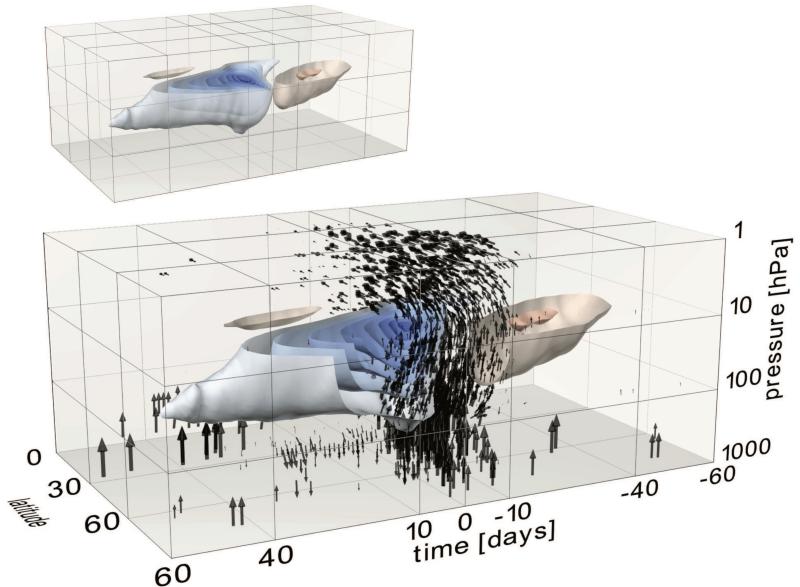


Fig. 17.25

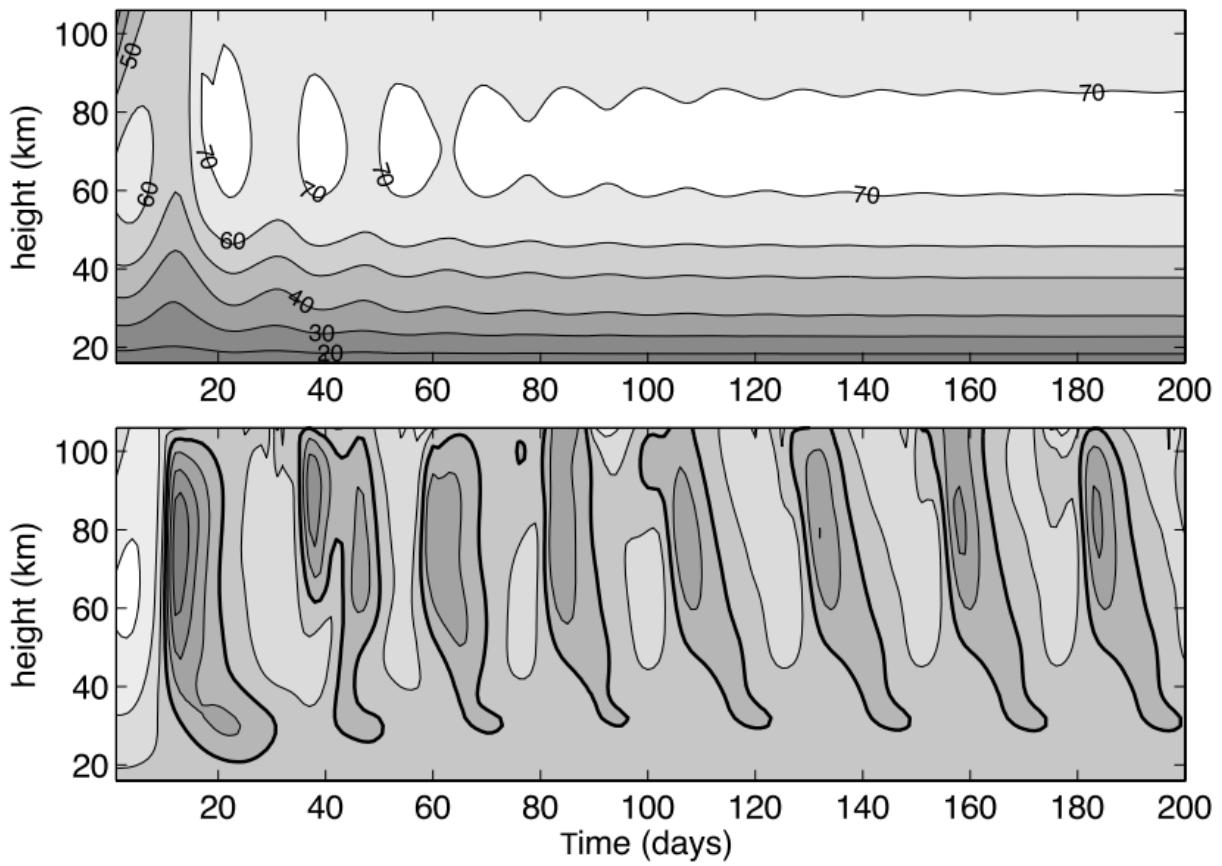


Fig. 17.26

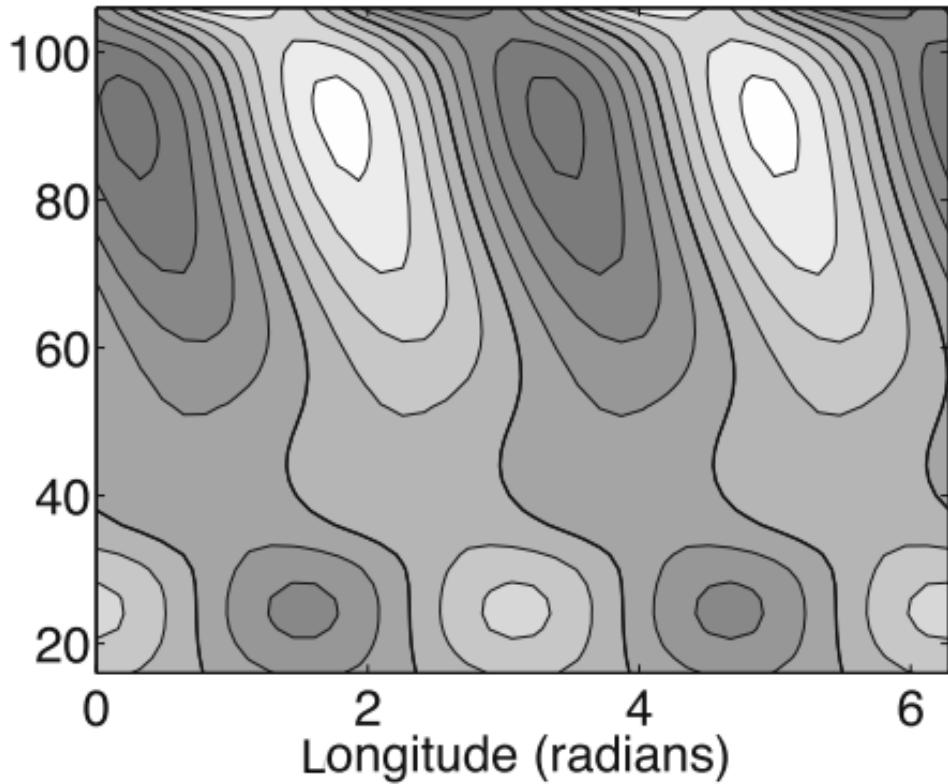
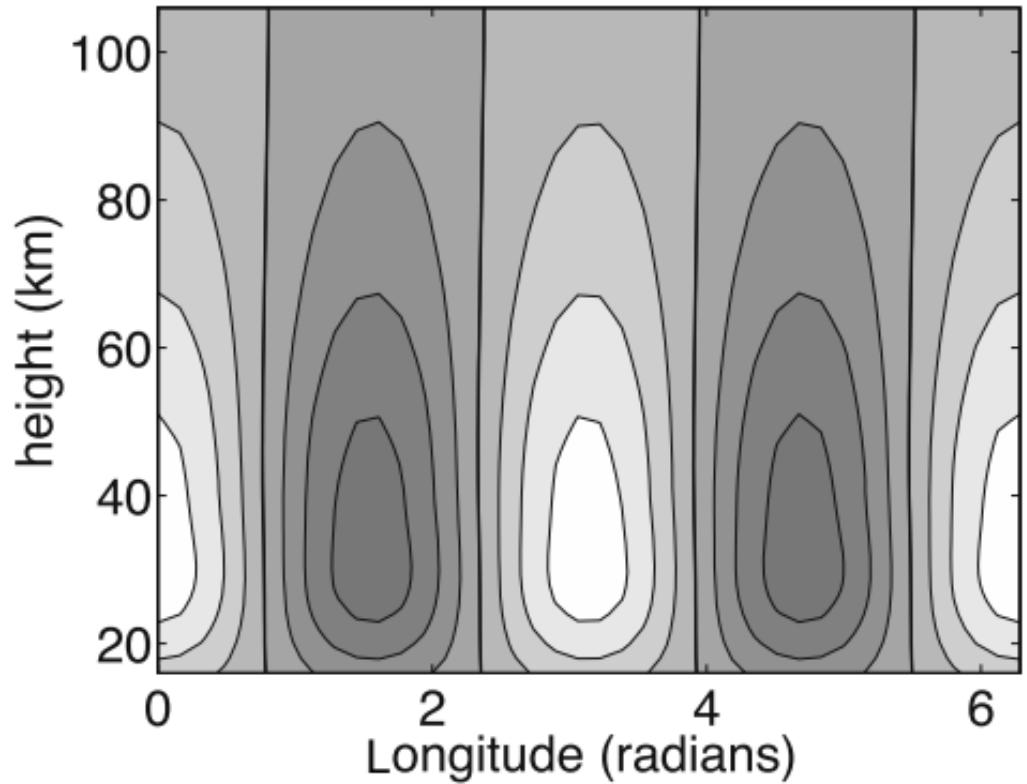


Fig. 17.27

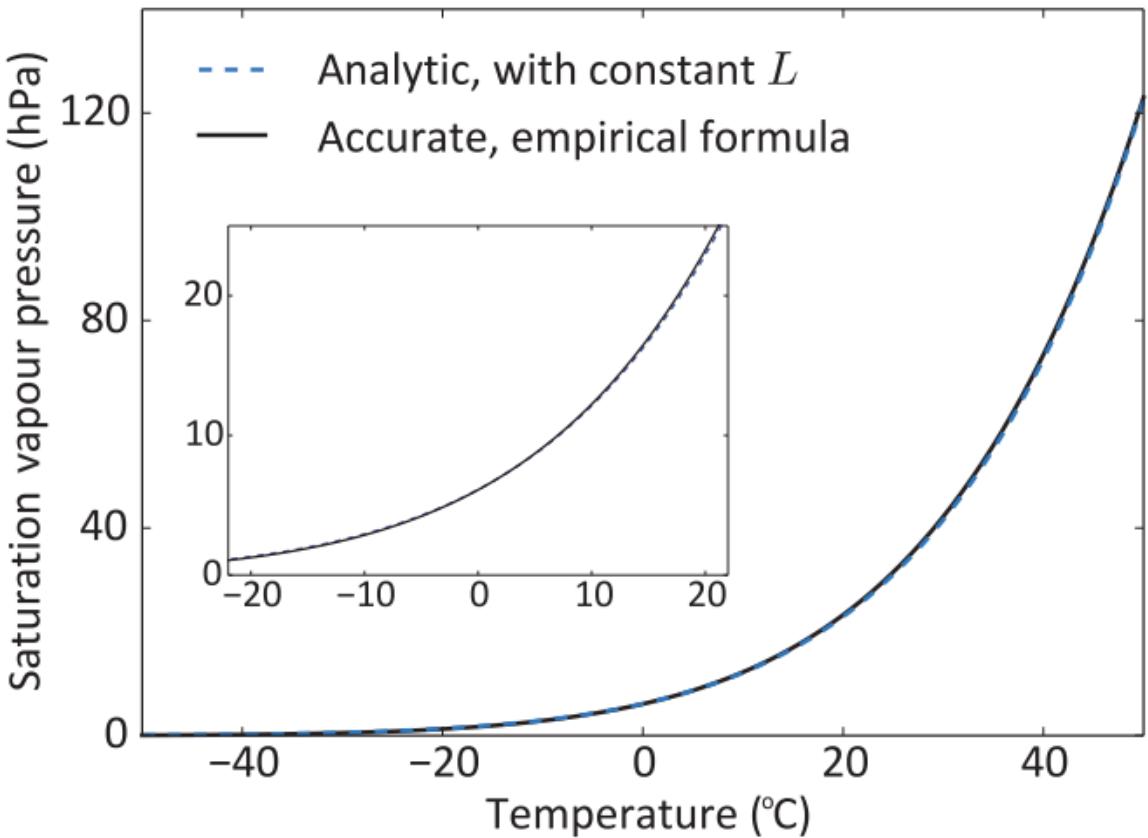


Fig. 18.1

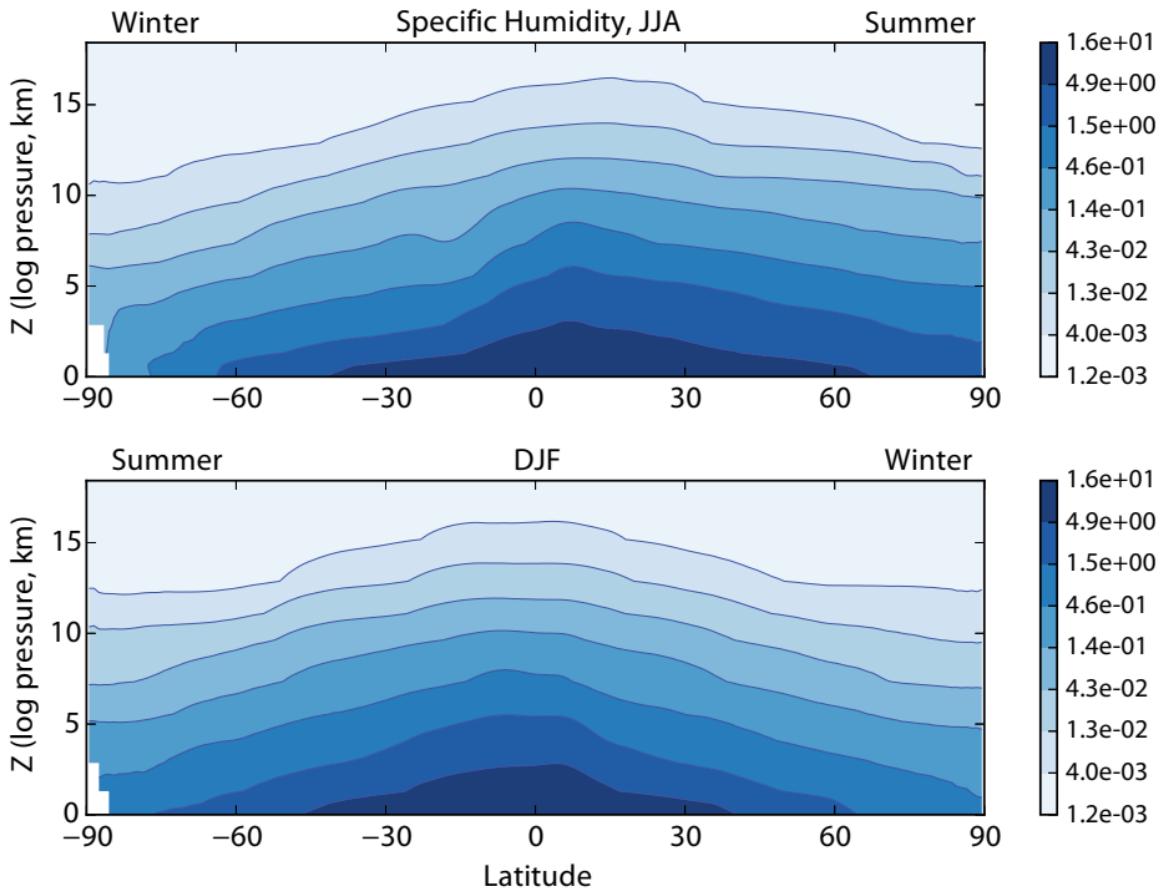


Fig. 18.2

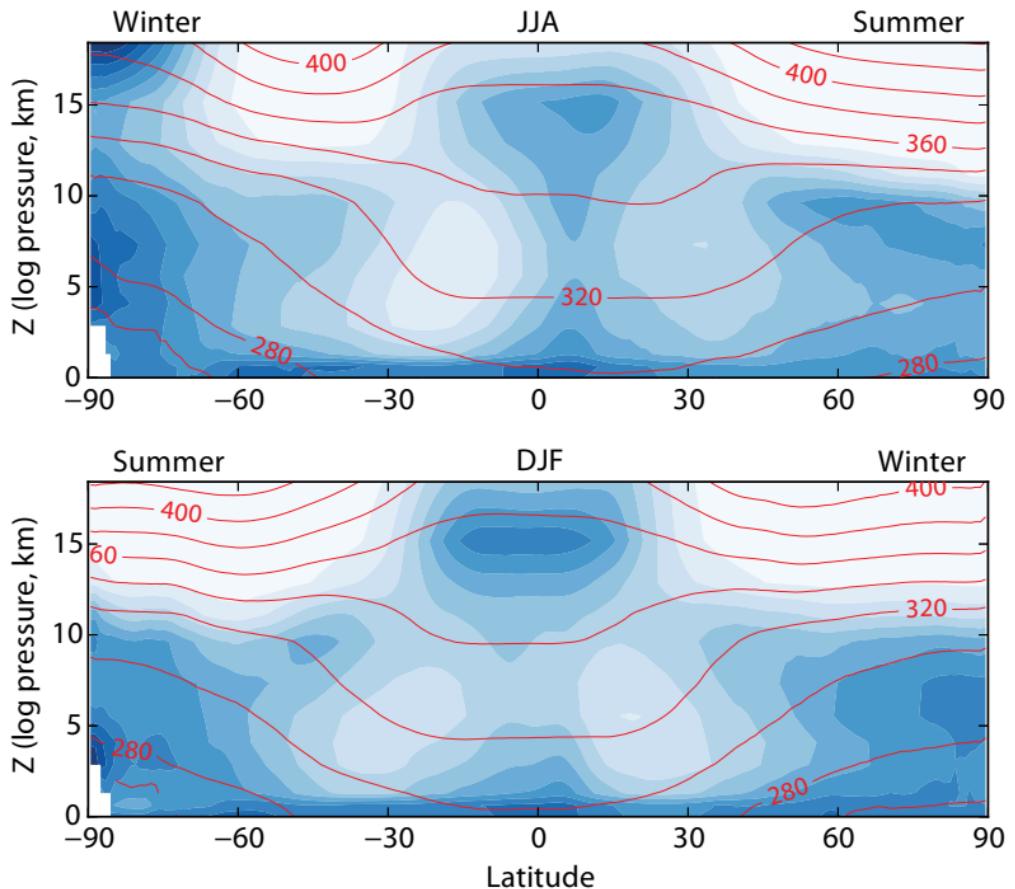


Fig. 18.3

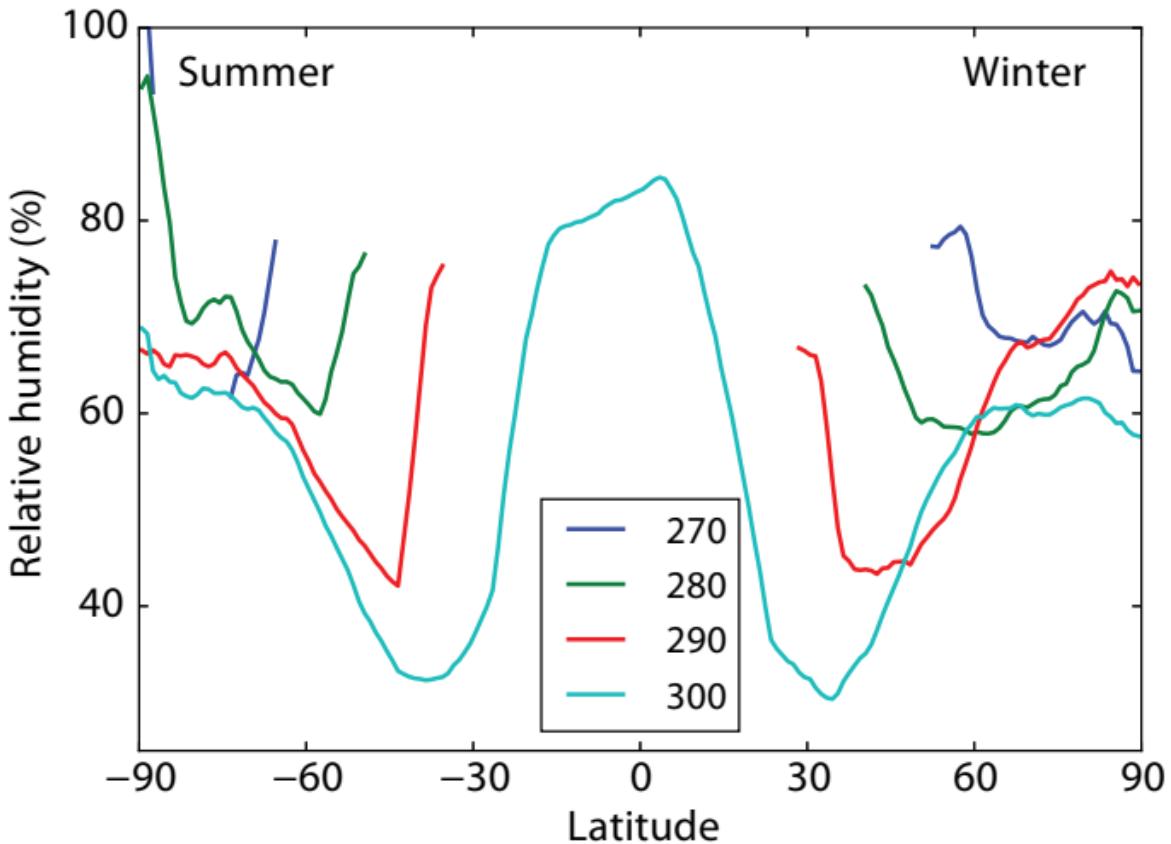


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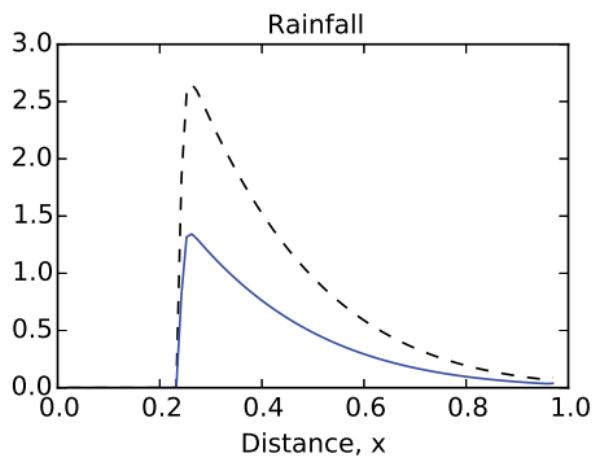
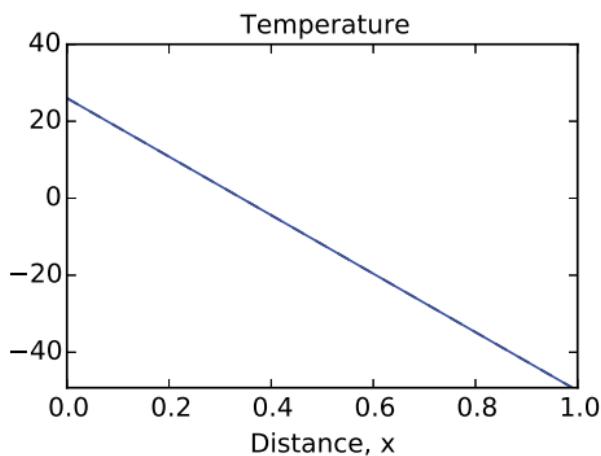
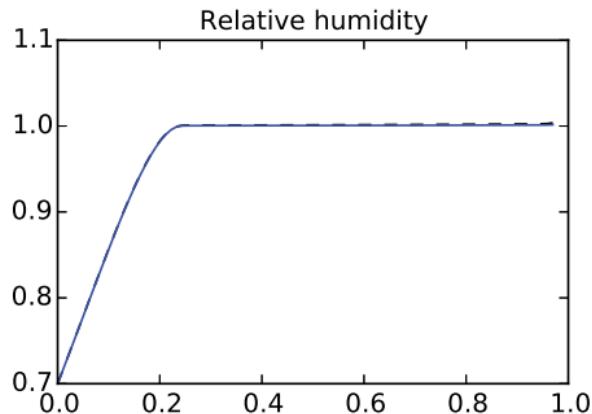
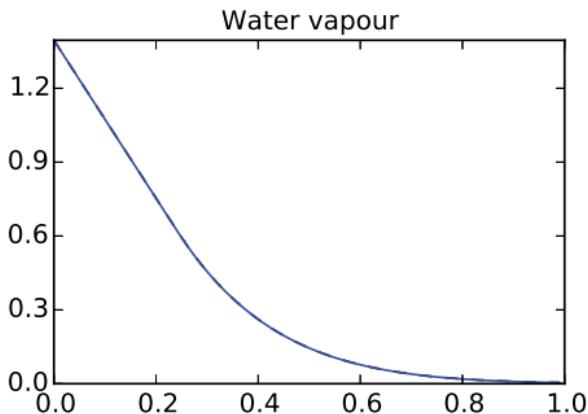


Fig. 18.5

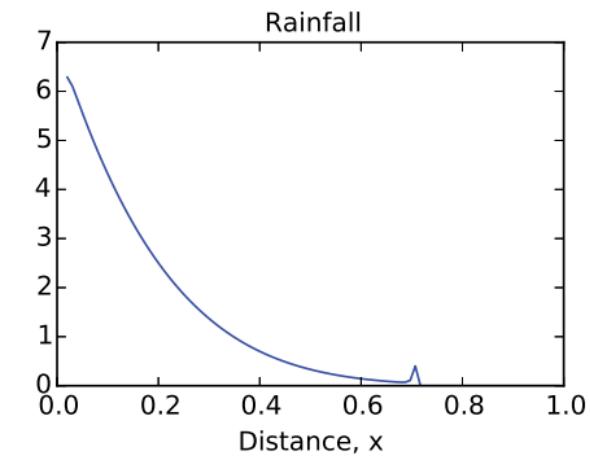
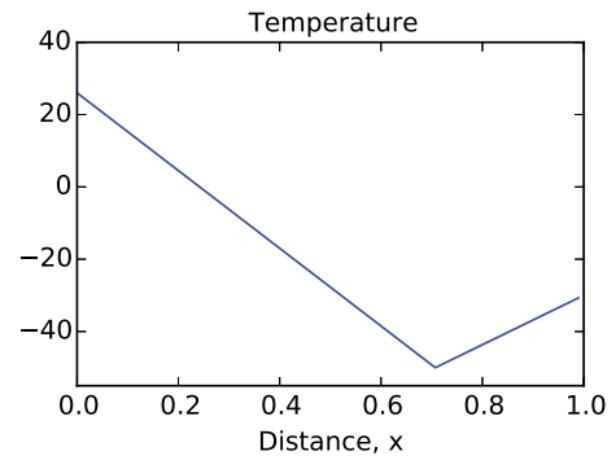
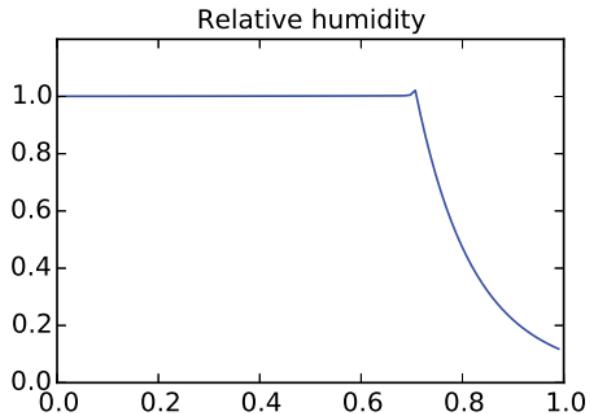
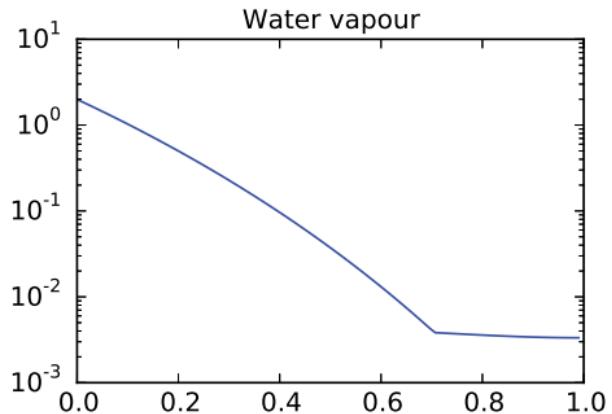


Fig. 18.6

RH, Annual Mean, 925 hPa

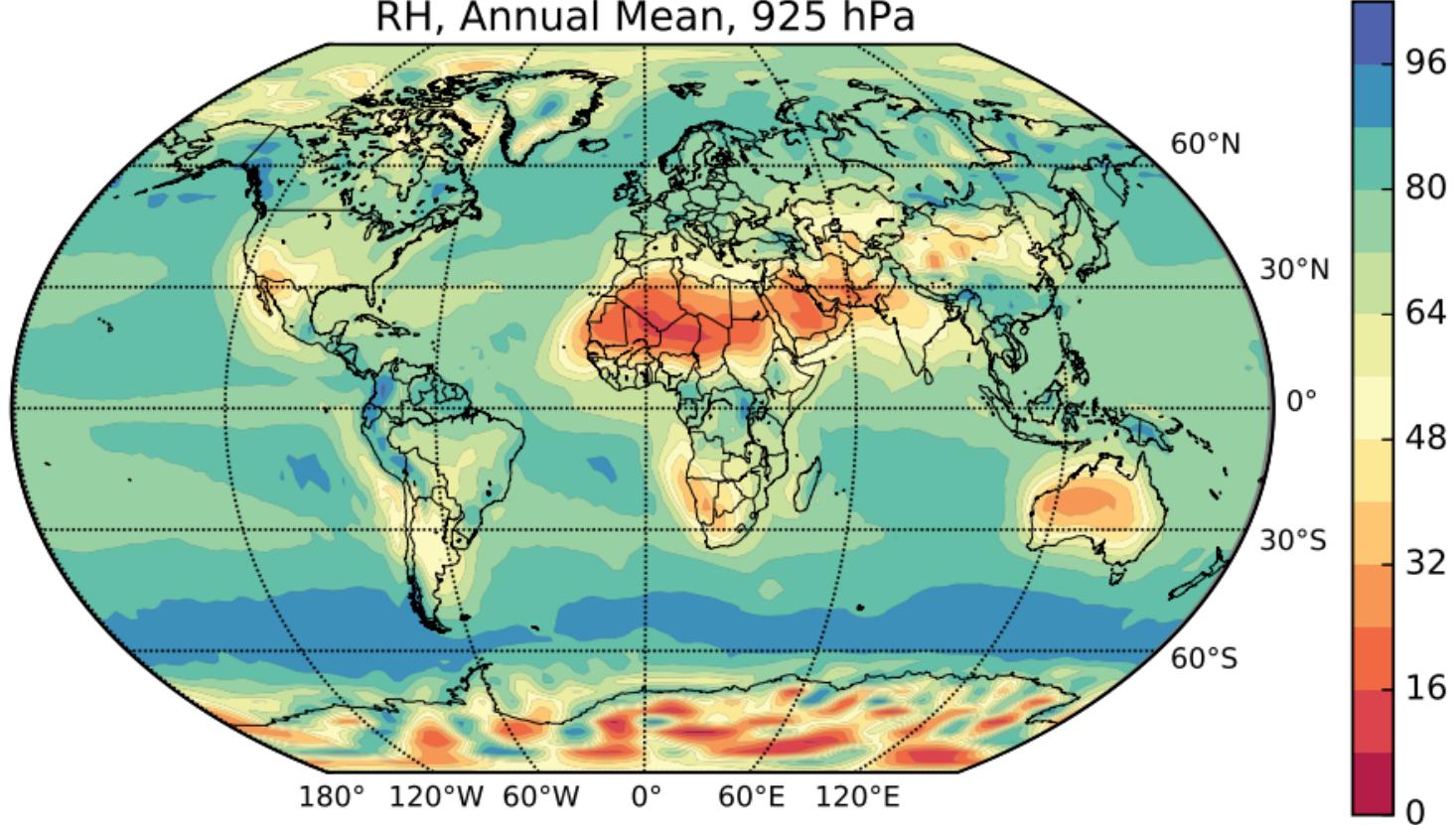


Fig. 18.7

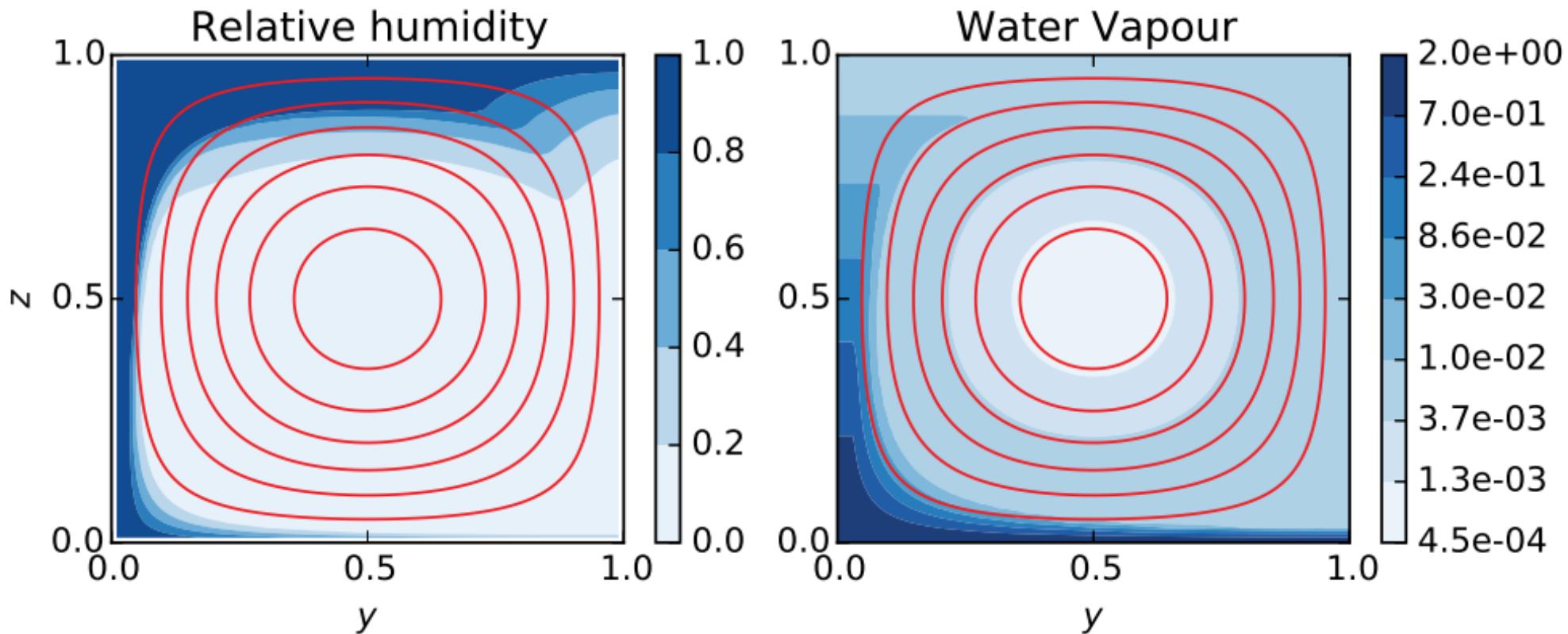


Fig. 18.8

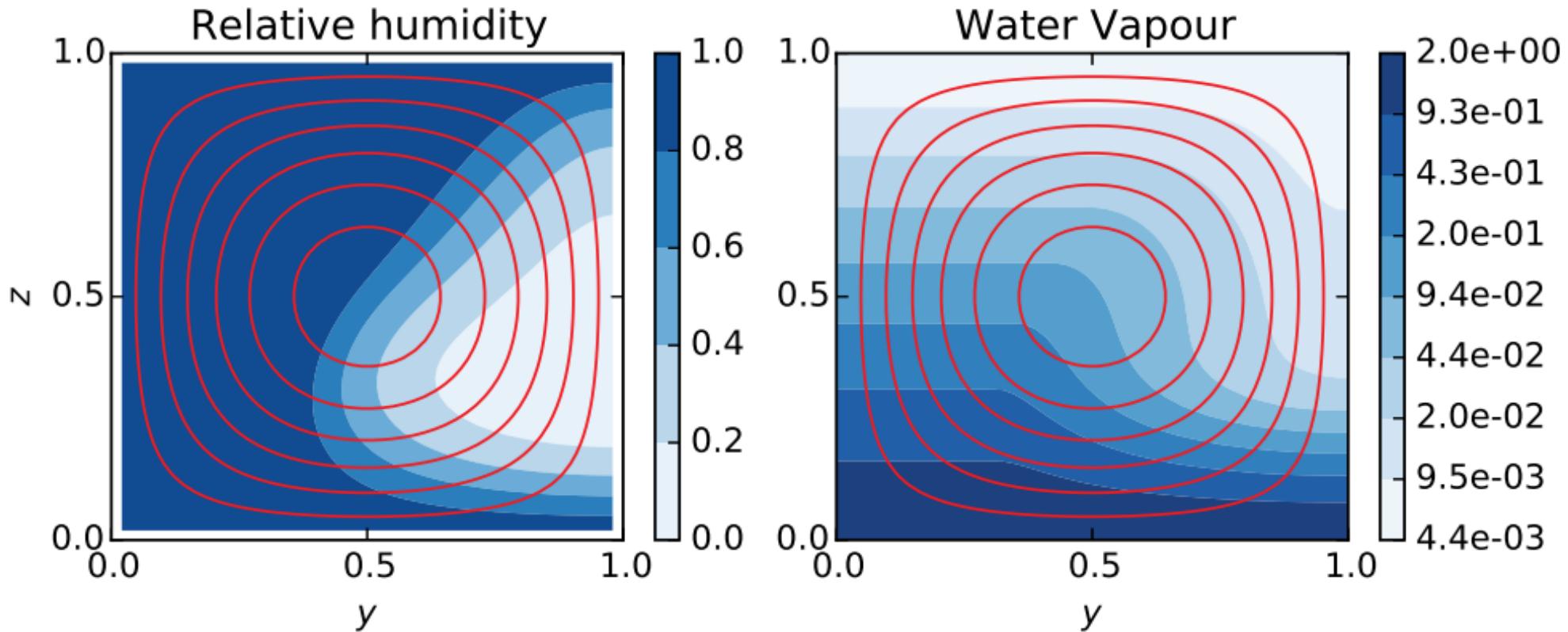
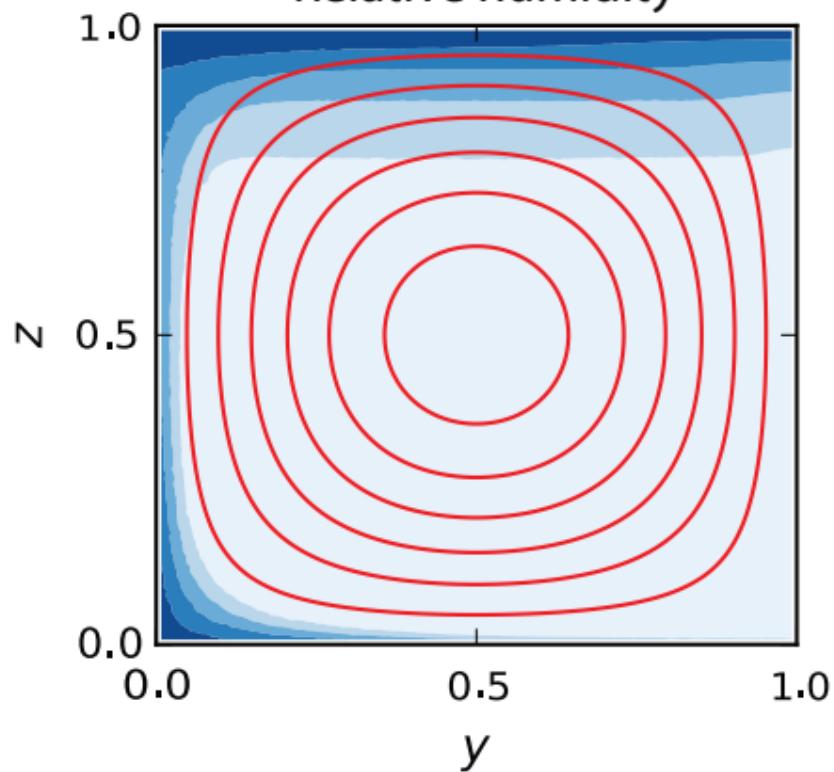


Fig. 18.9

Relative humidity



Relative humidity

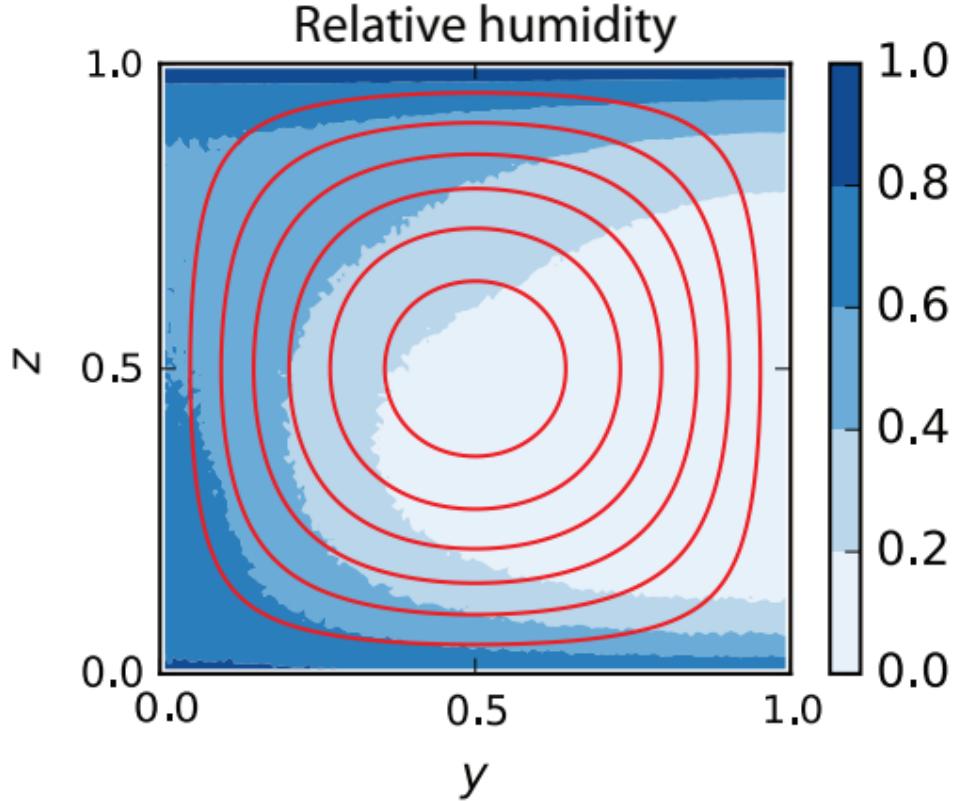


Fig. 18.10

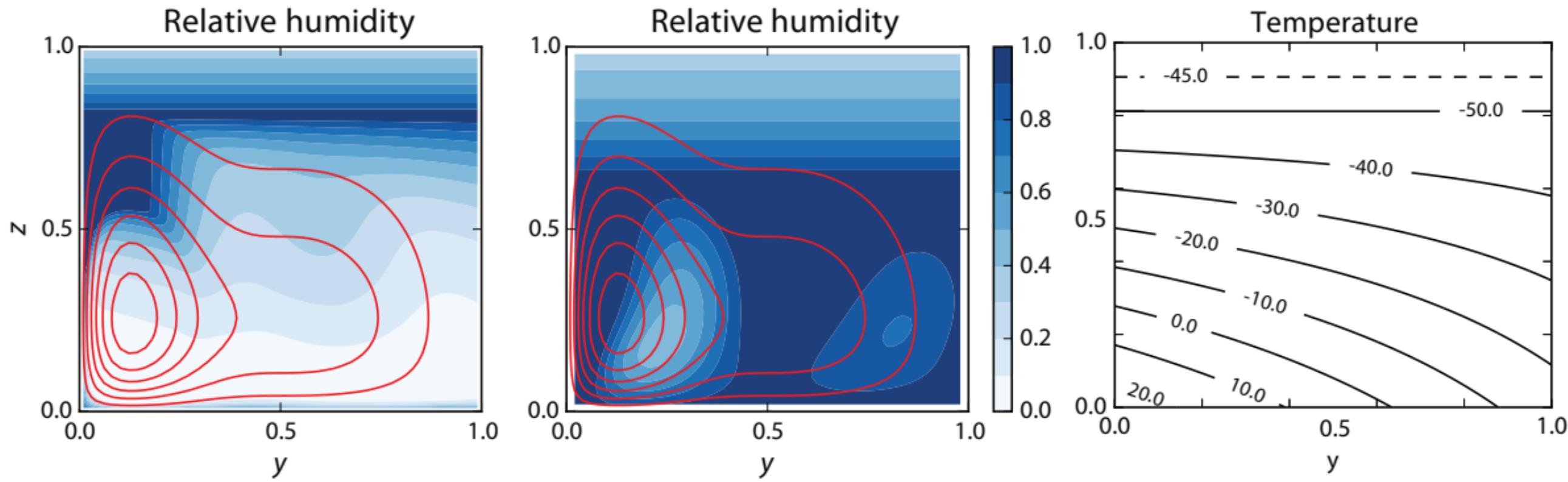


Fig. 18.11

Relative humidity, 500 hPa

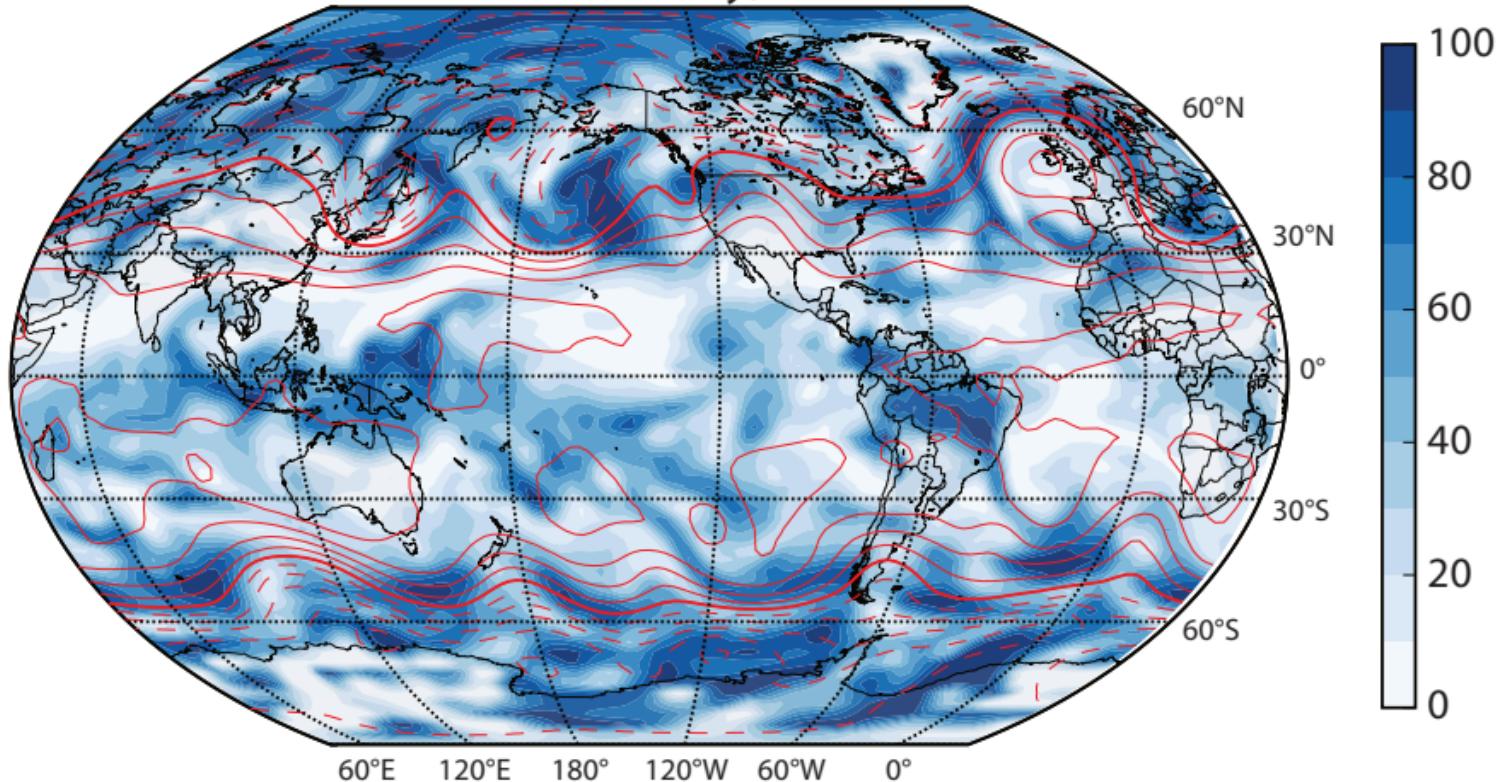


Fig. 18.12

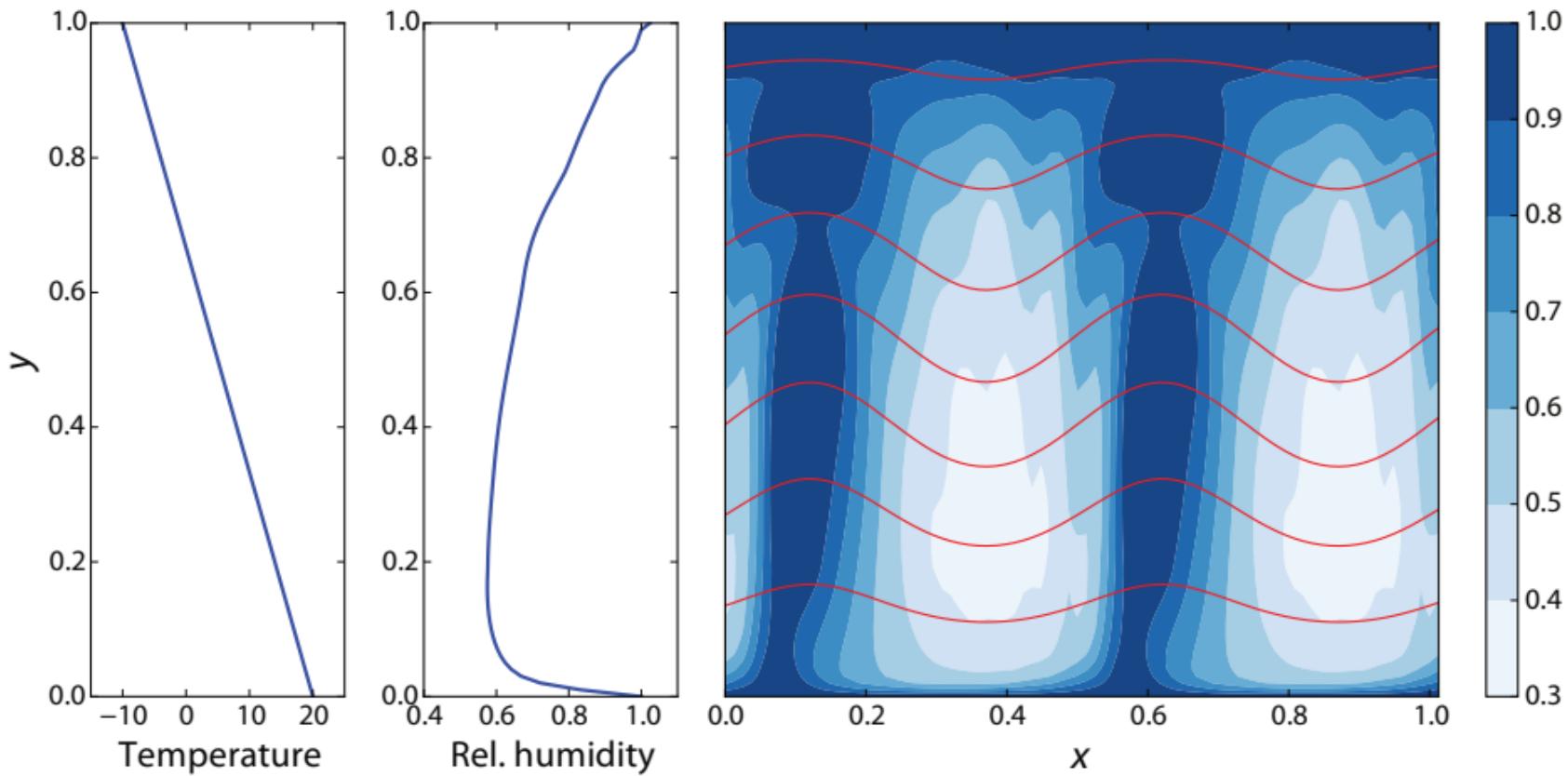


Fig. 18.13

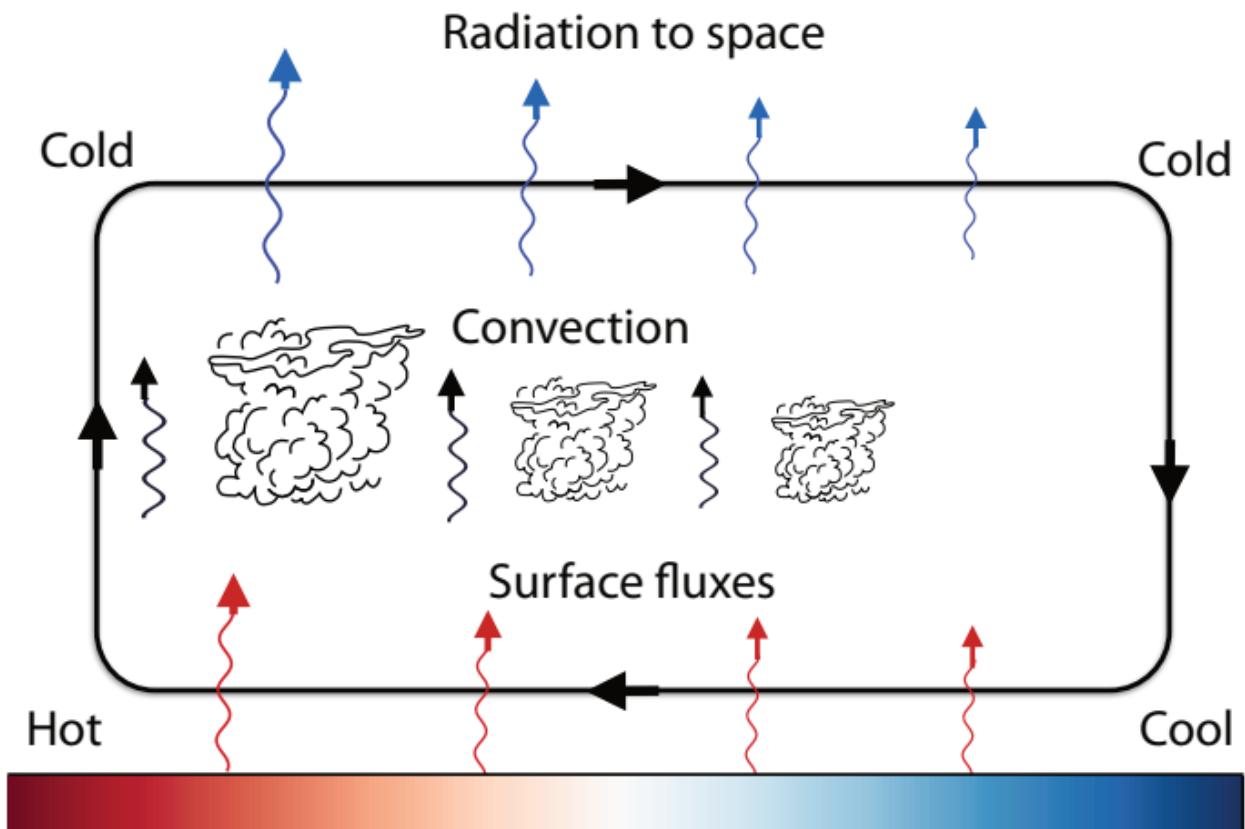


Fig. 18.14

Saturated adiabatic lapse rate (K/km)

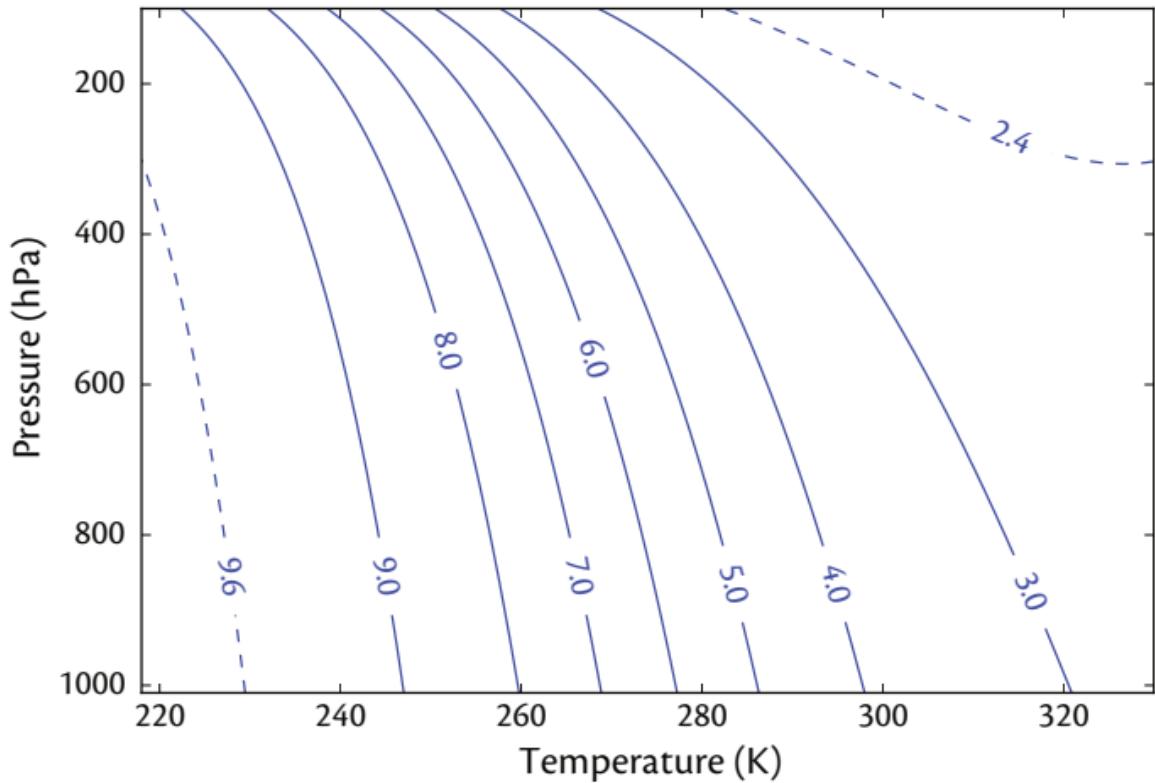


Fig. 18.15

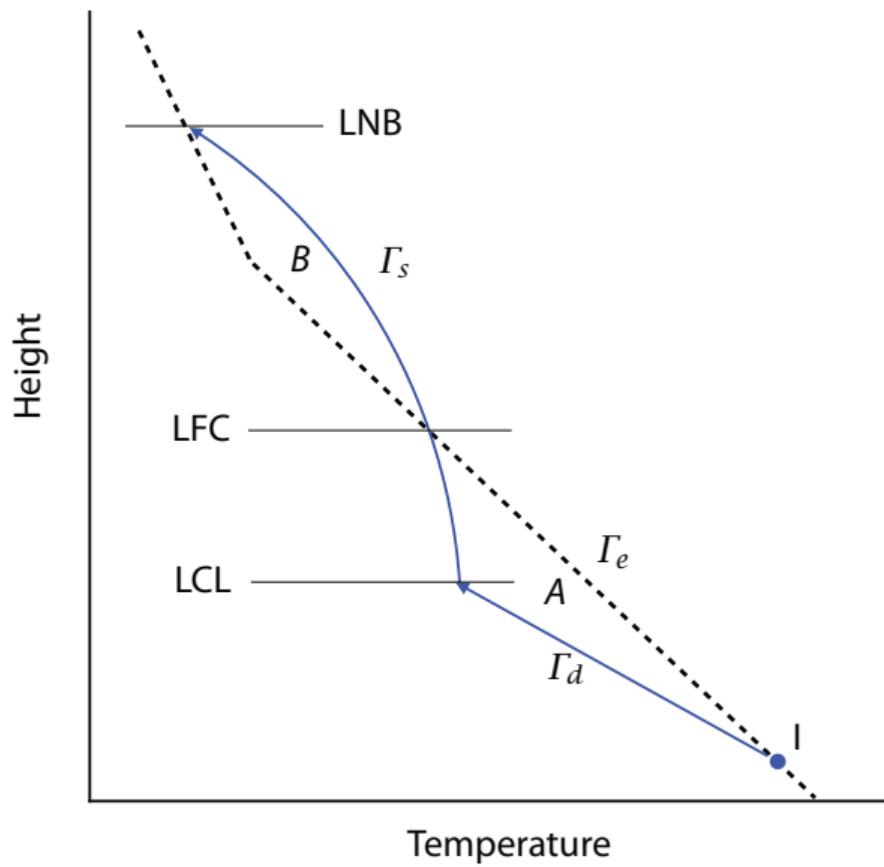


Fig. 18.16

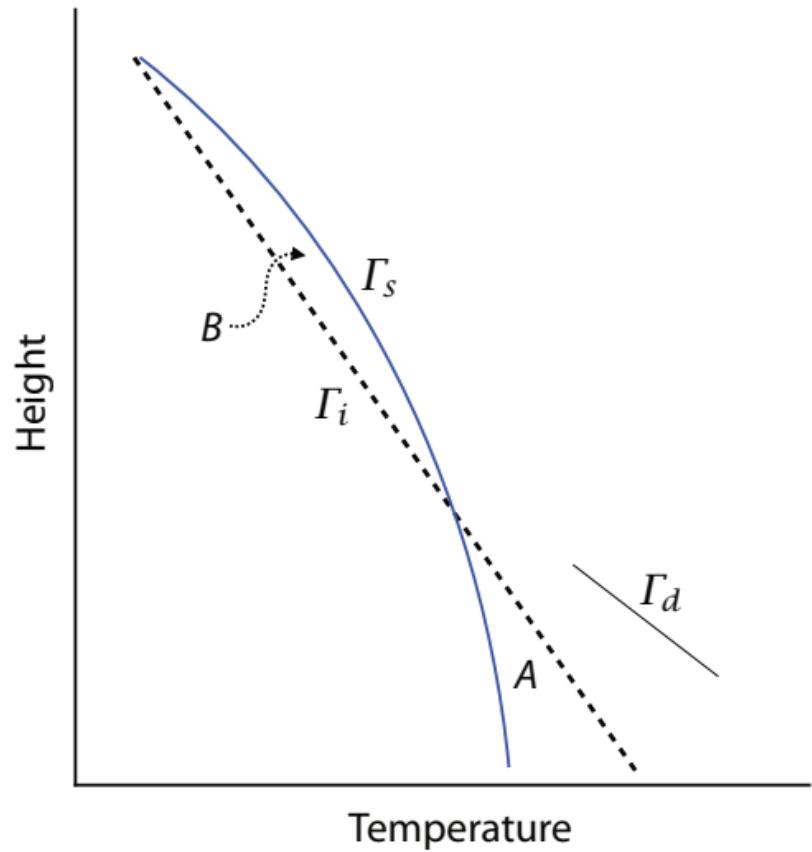
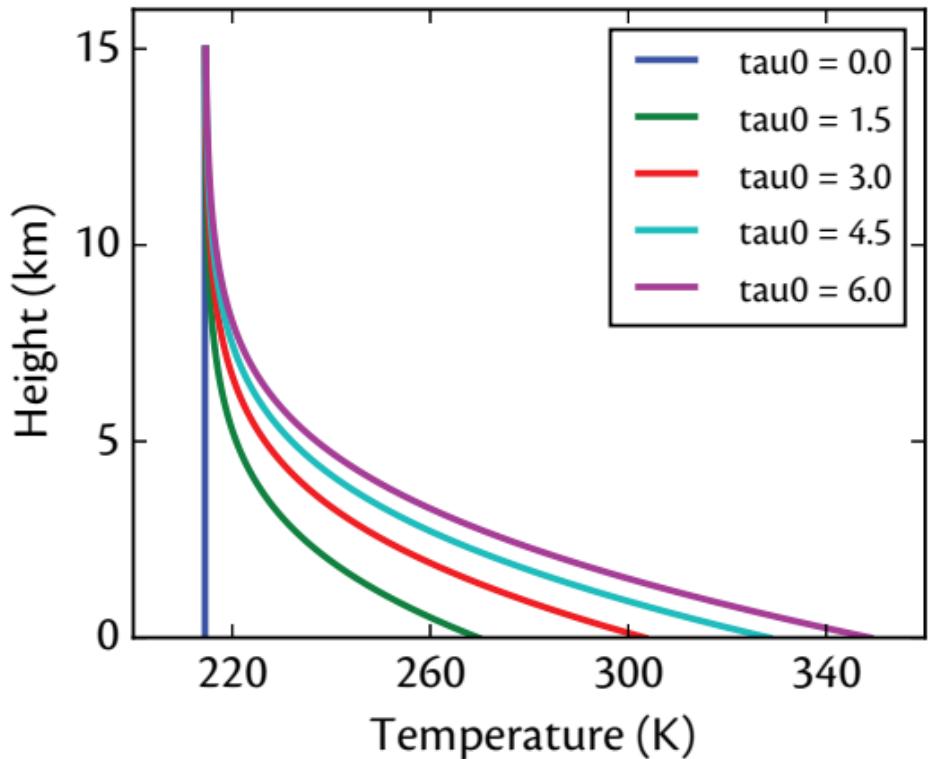


Fig. 18.17

Varying optical depth



Varying outgoing IR

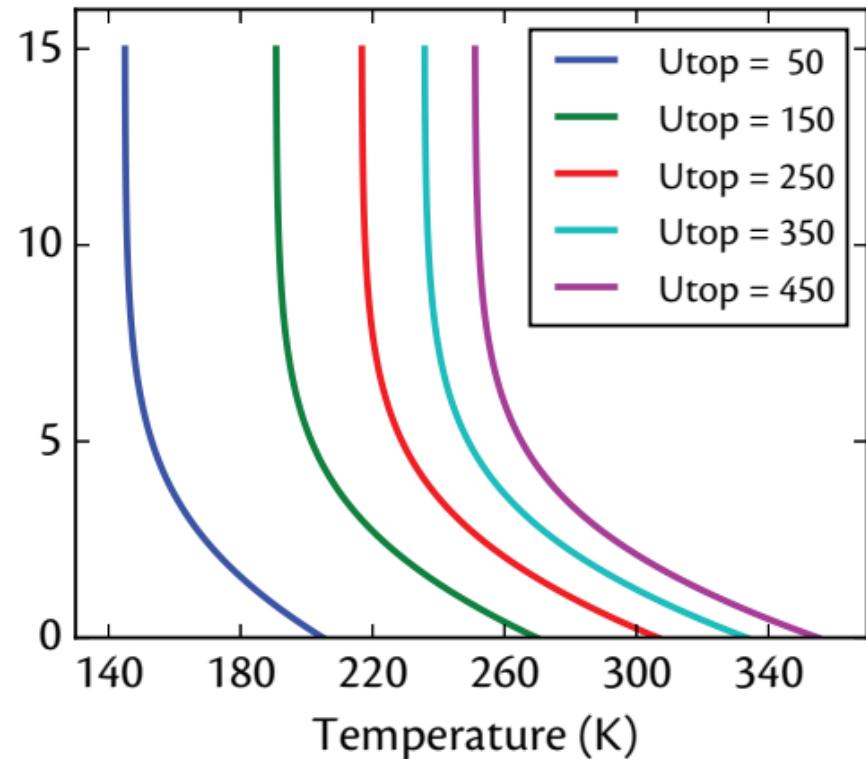


Fig. 18.18

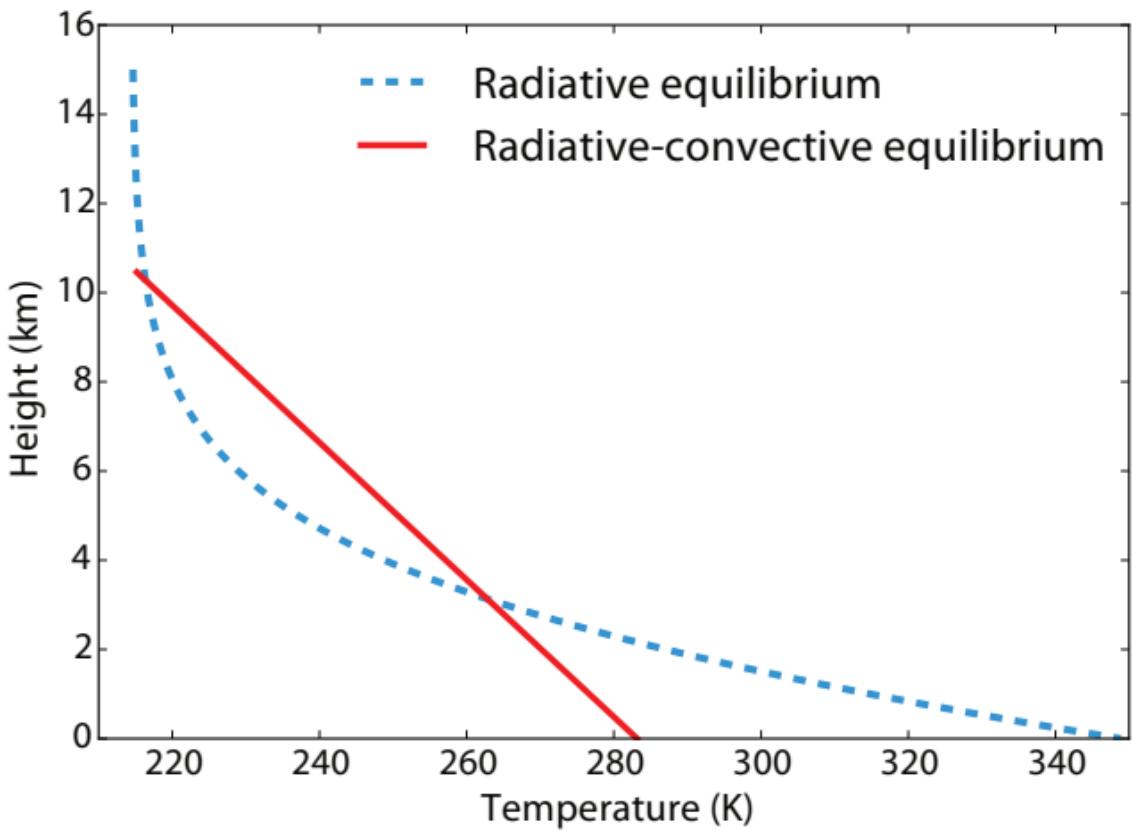


Fig. 18.19

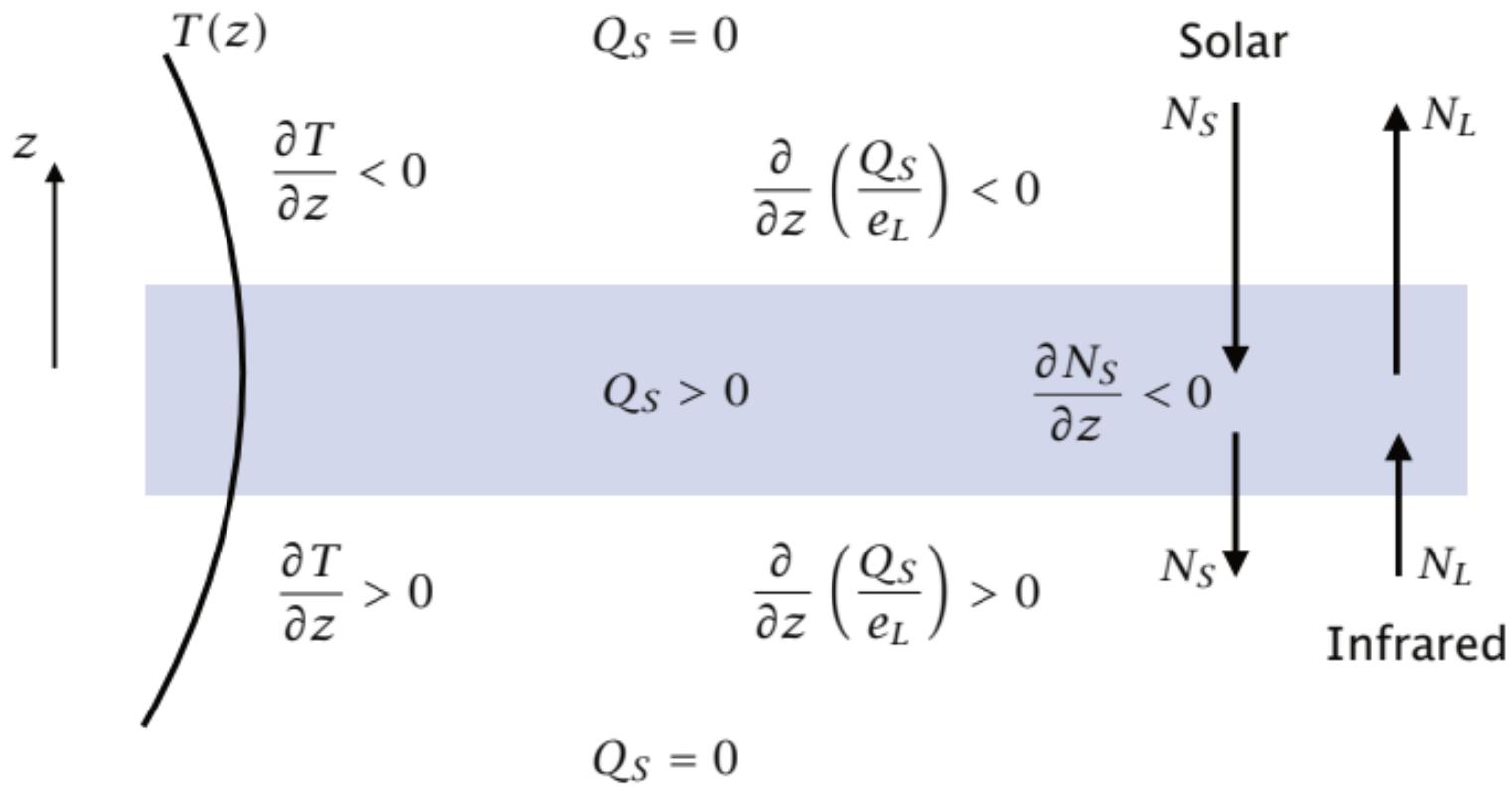
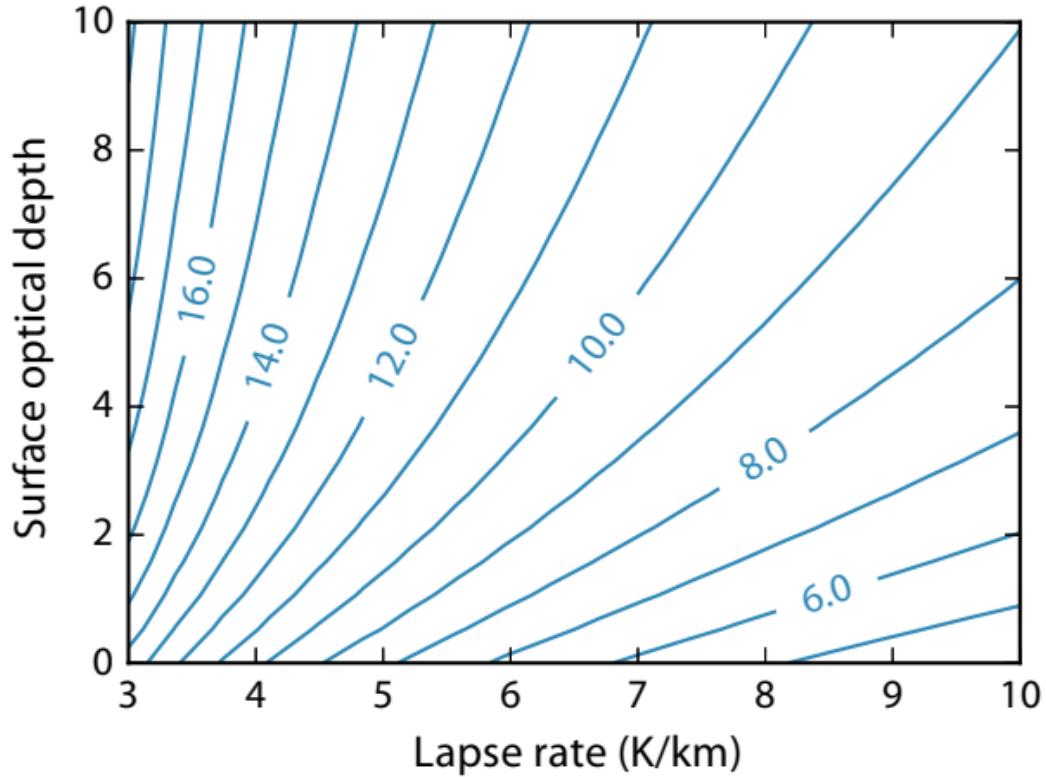


Fig. 18.20

Numerical solution



Analytic approximation

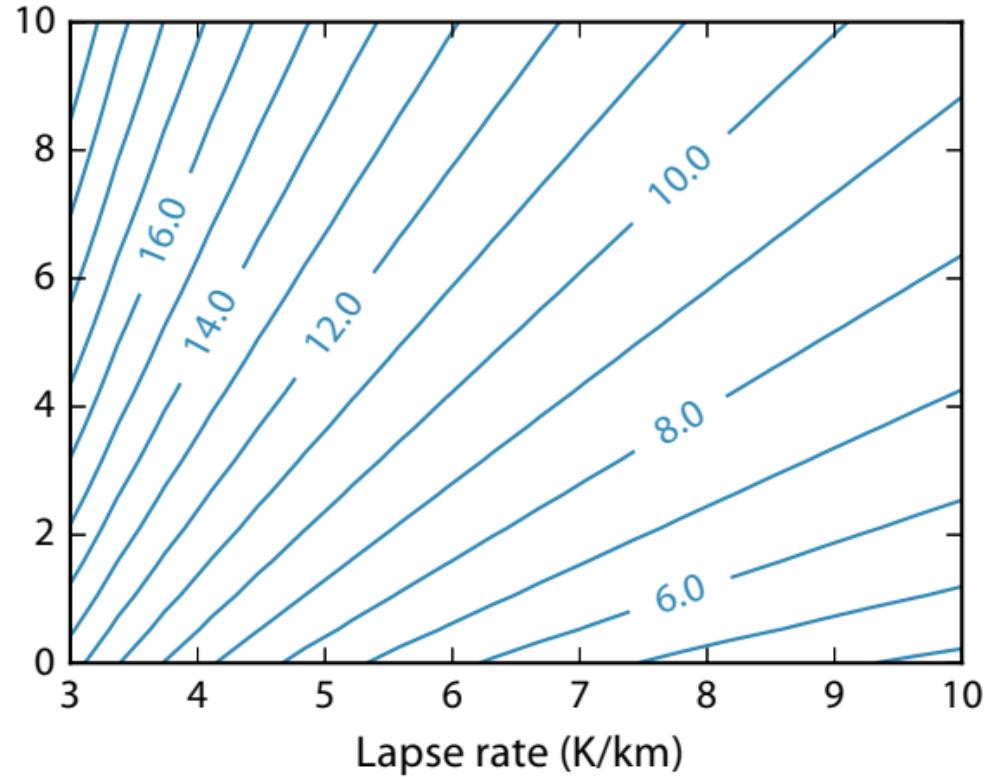


Fig. 18.21

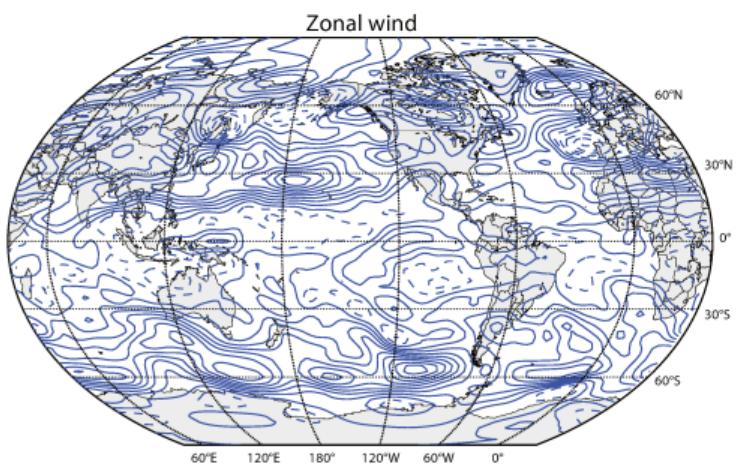
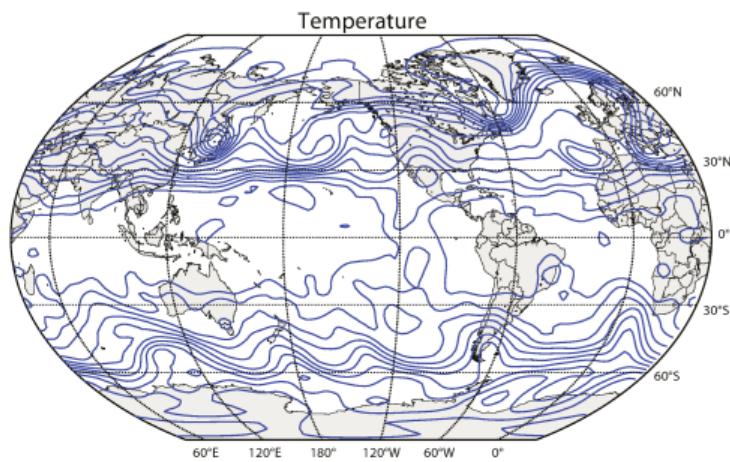
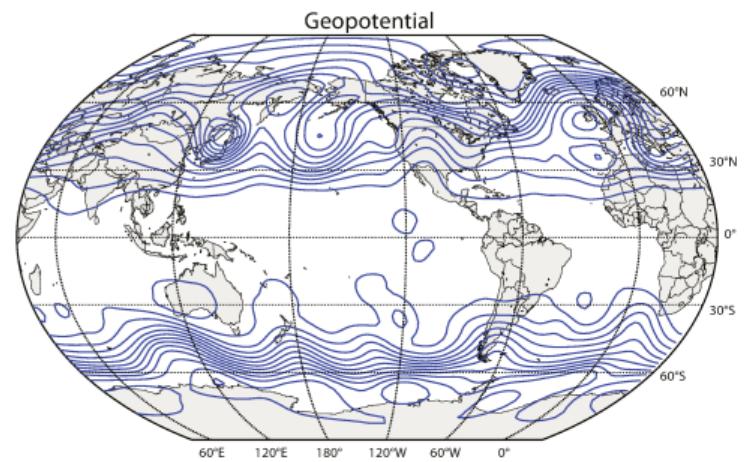


Fig. 18.22

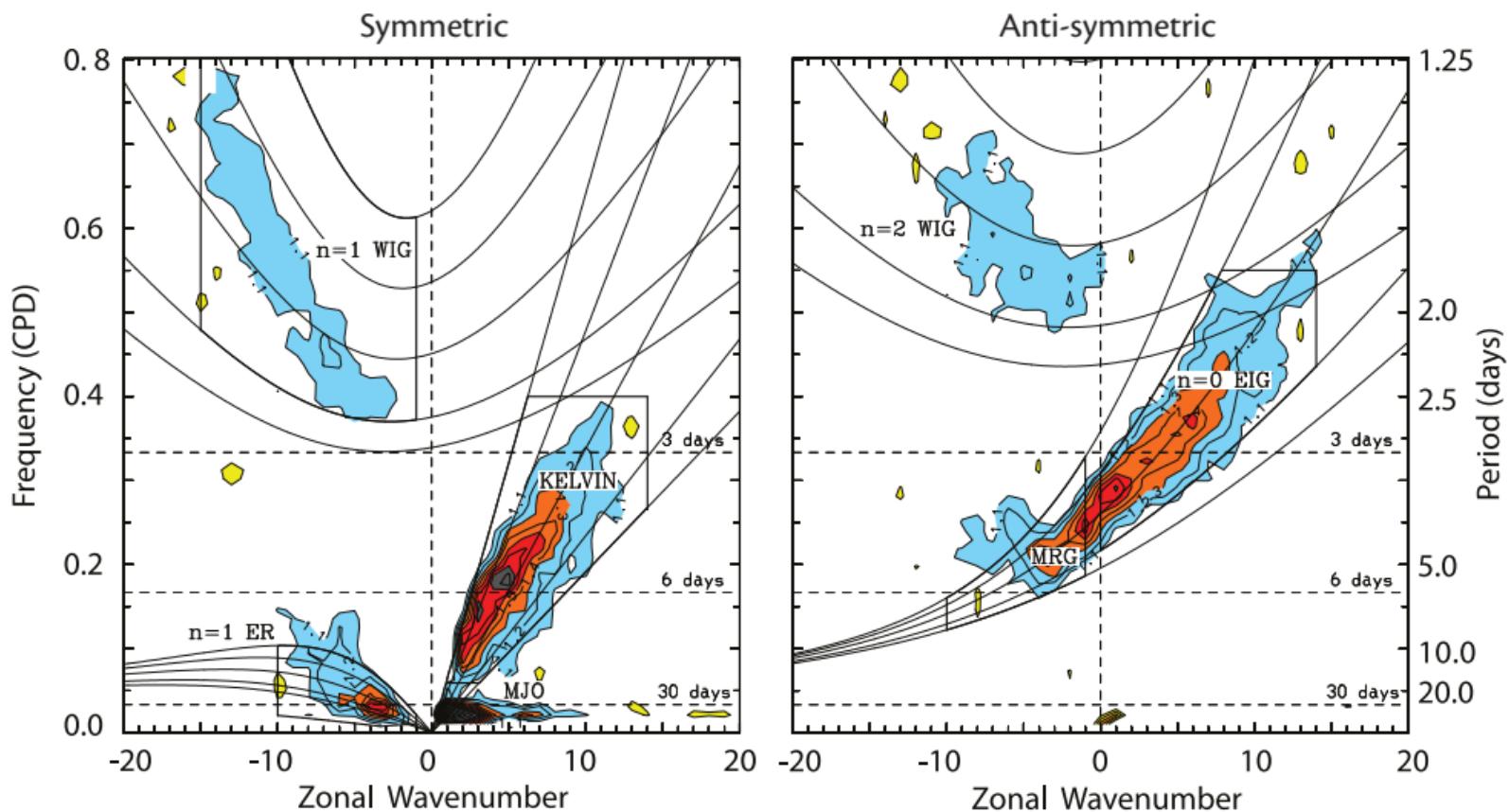


Fig. 18.23

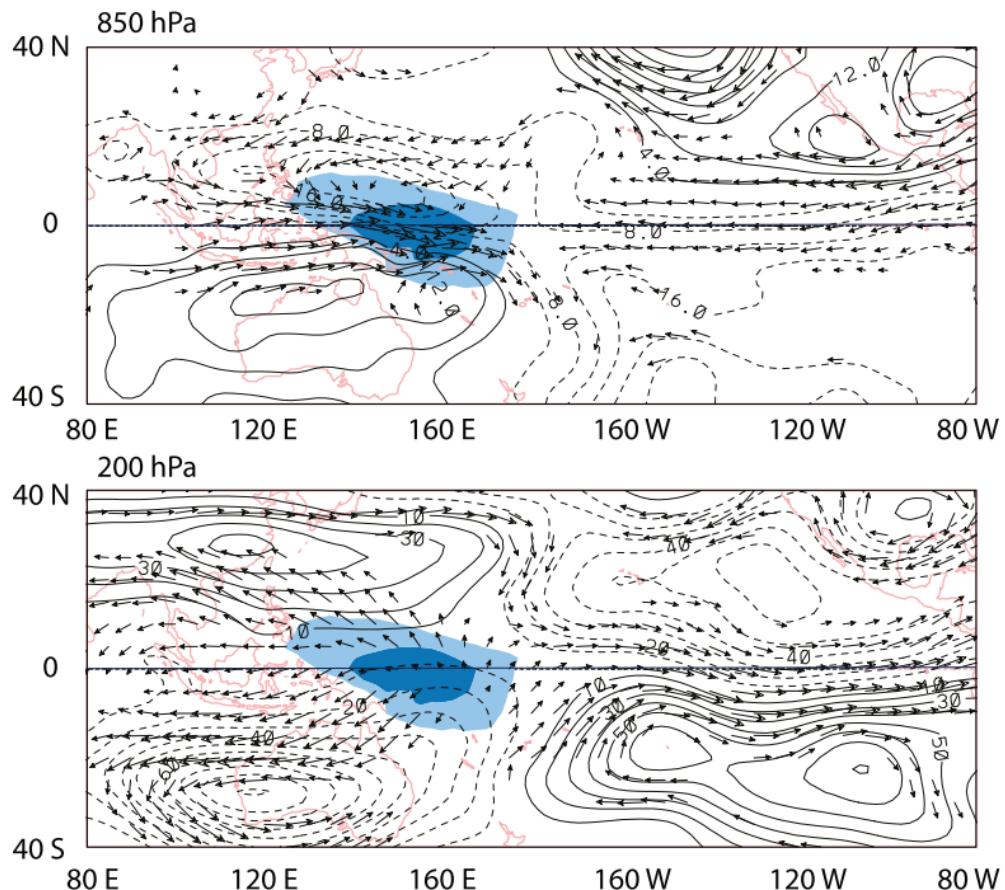


Fig. 18.24

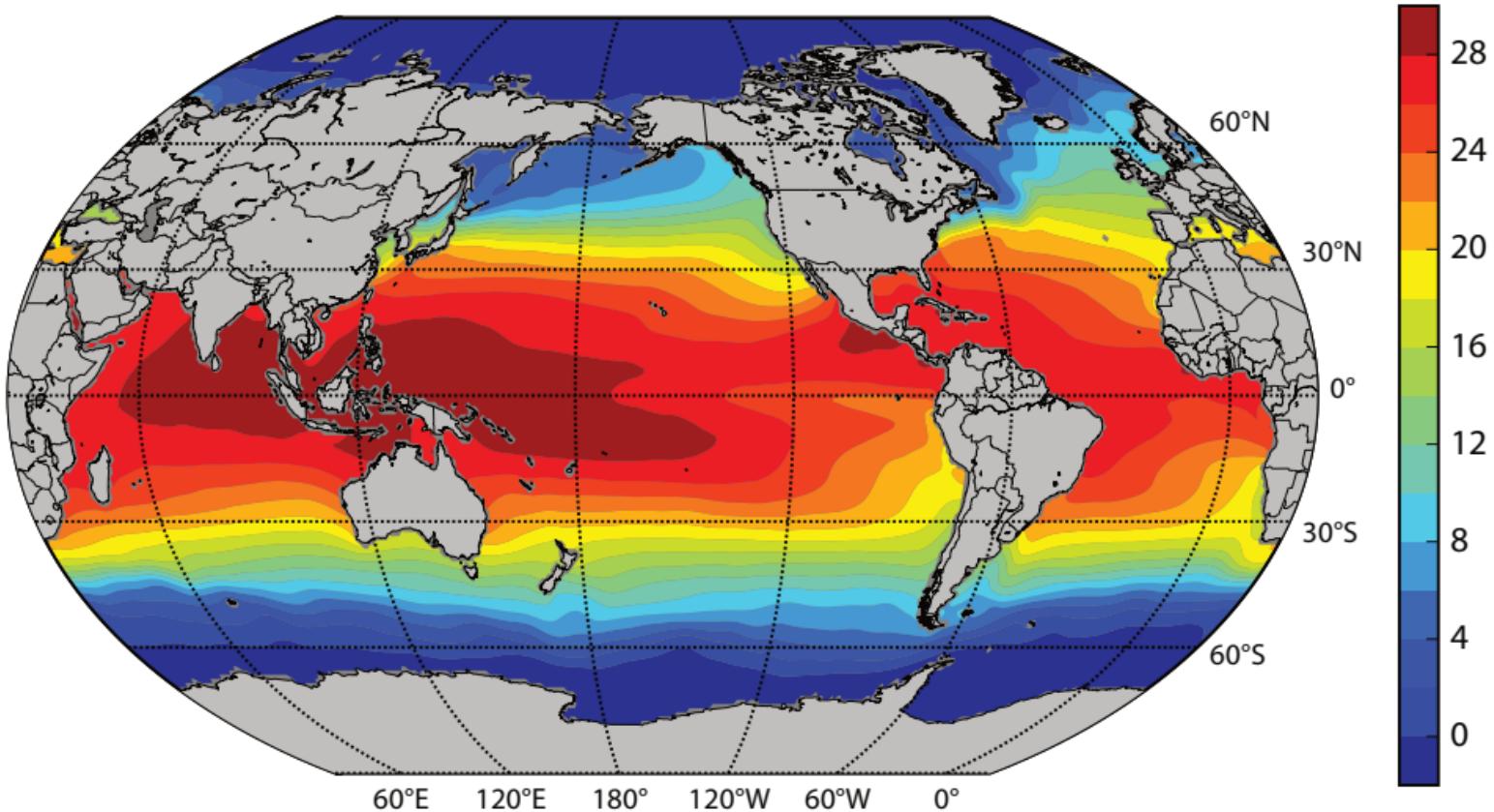


Fig. 19.1

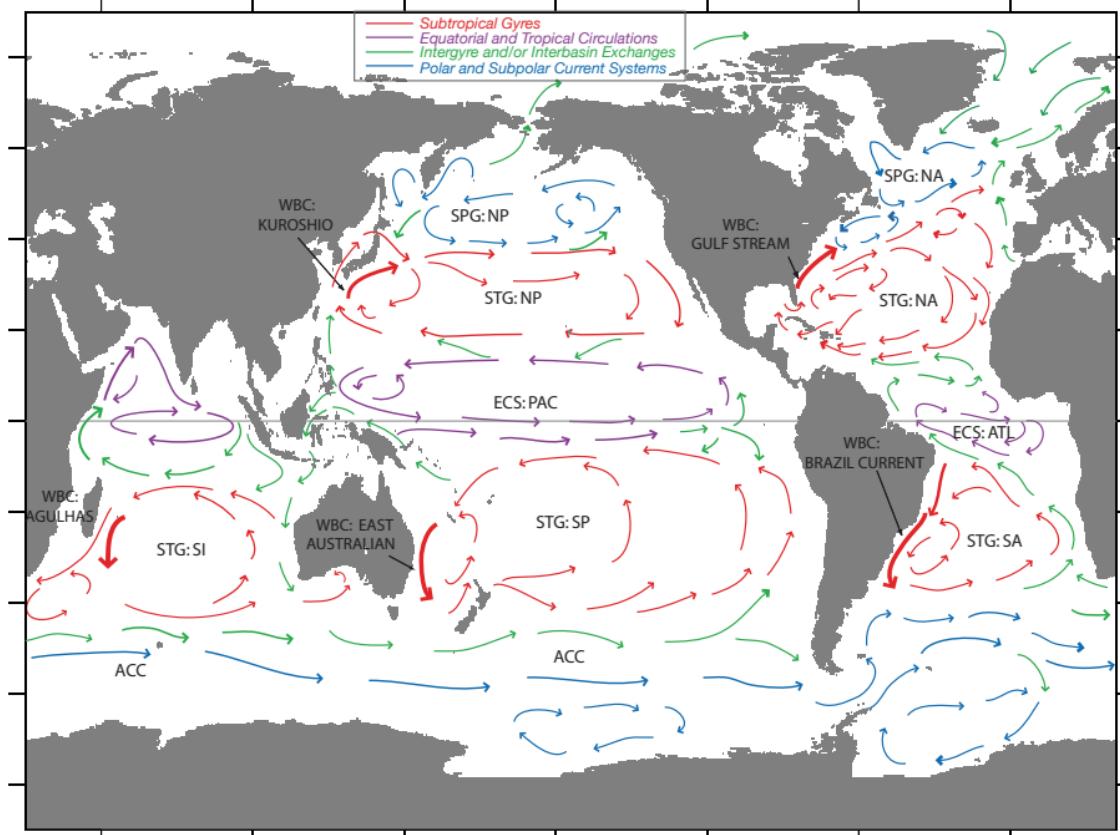


Fig. 19.2

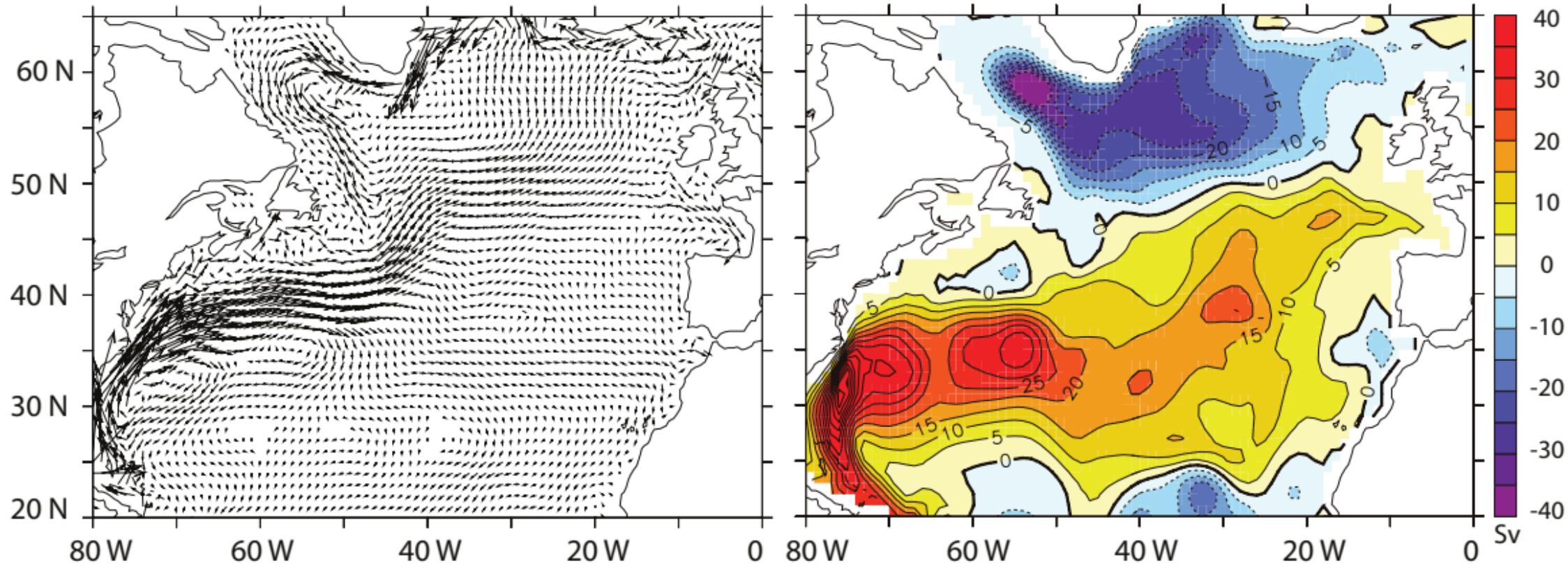


Fig. 19.3

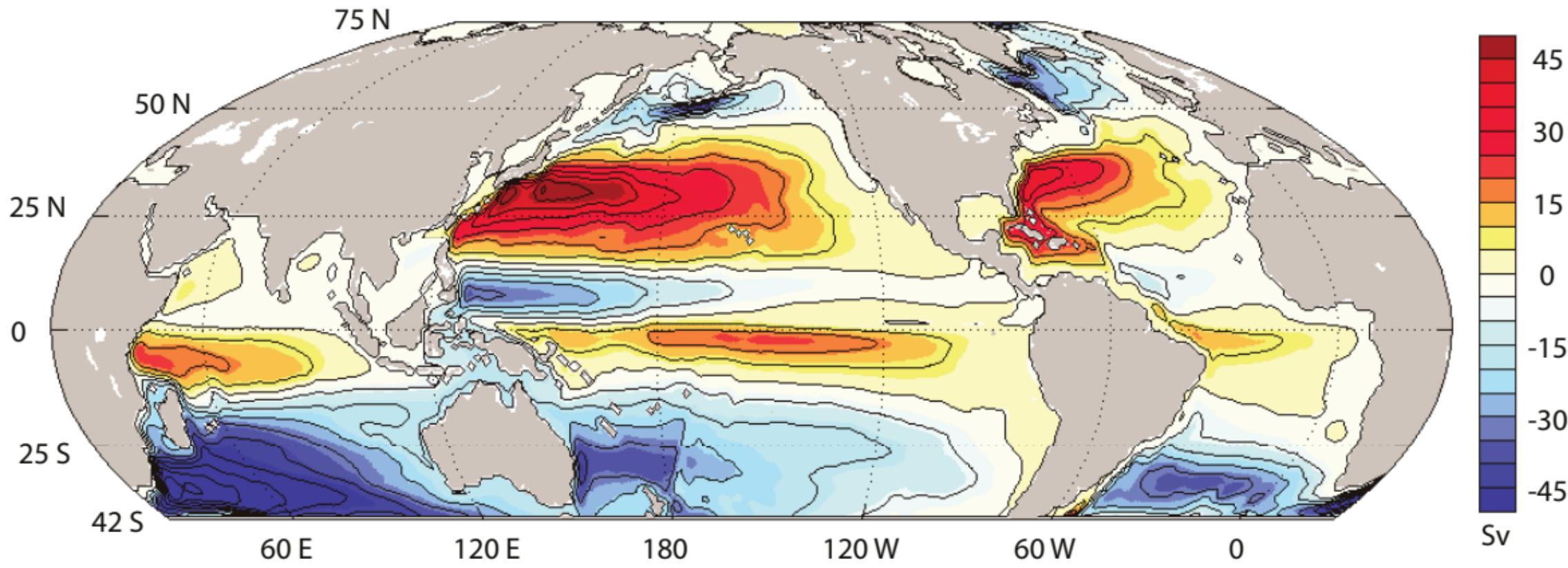
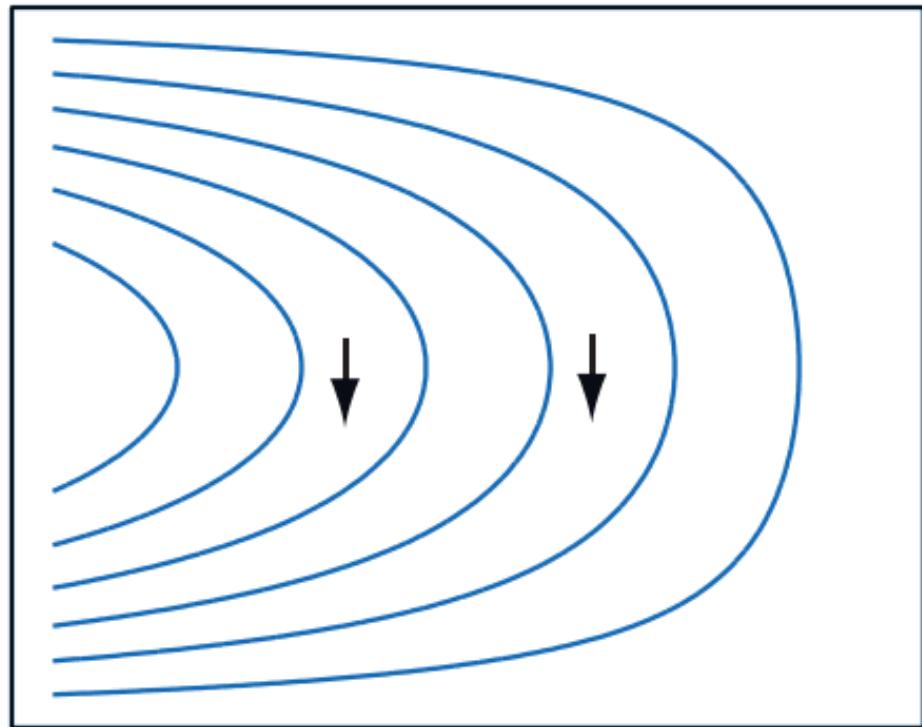
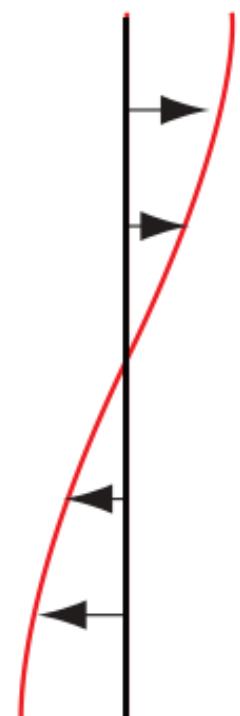


Fig. 19.4

Western boundary layer



Wind stress



Eastern boundary layer

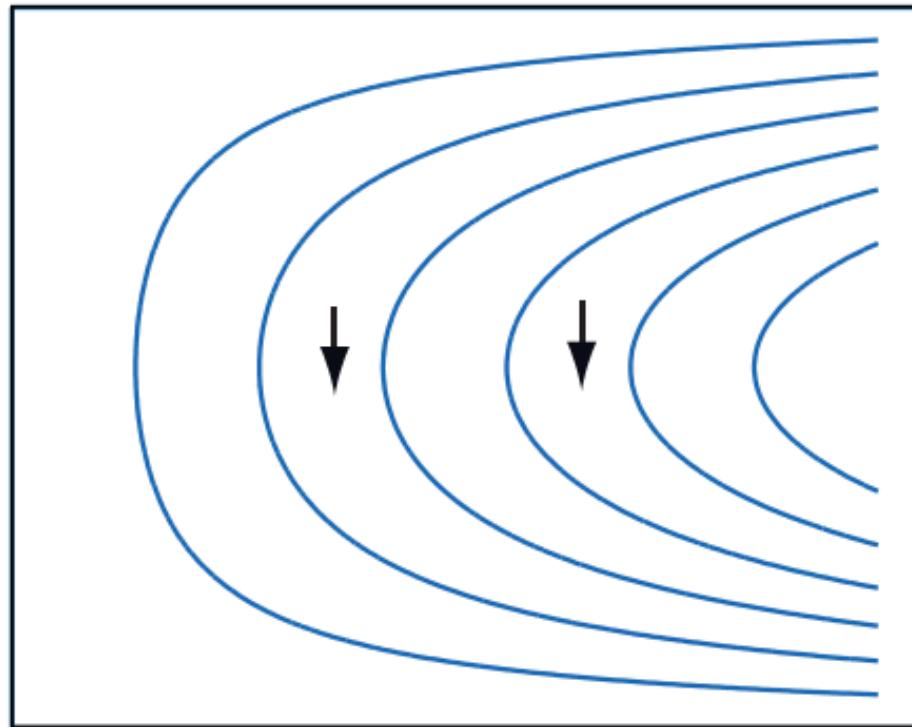
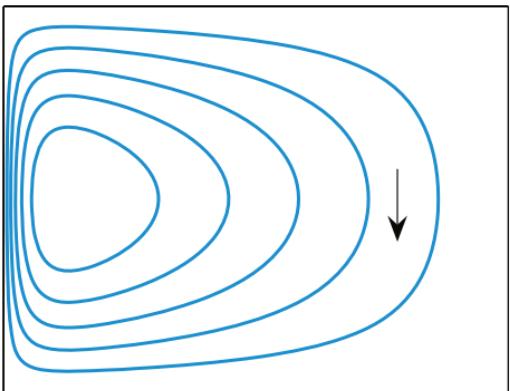


Fig. 19.5

Streamfunction



Wind stress

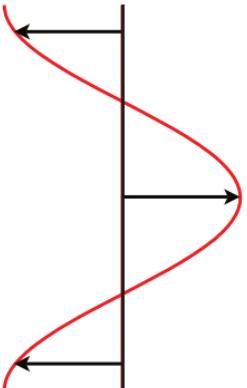
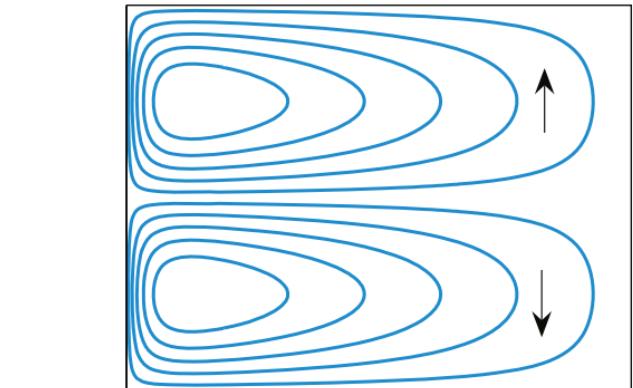
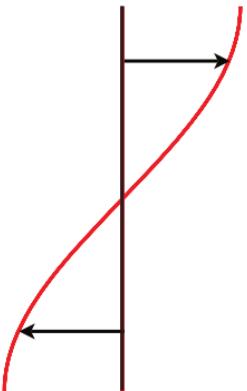
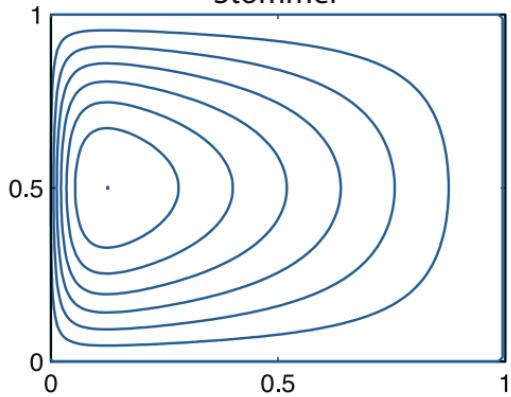


Fig. 19.6

Stommel



Munk

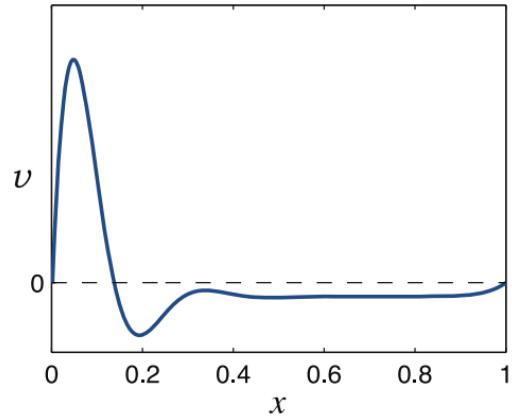
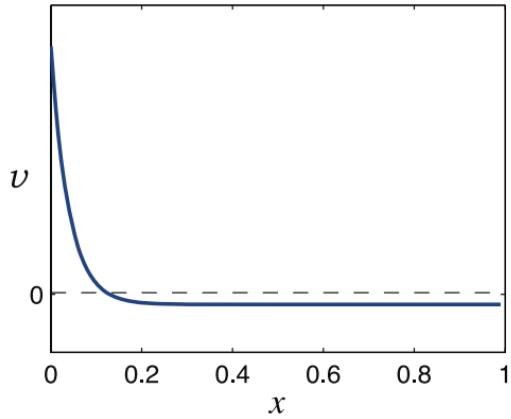
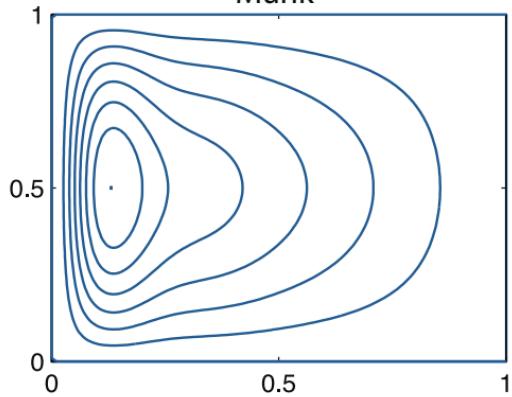


Fig. 19.7

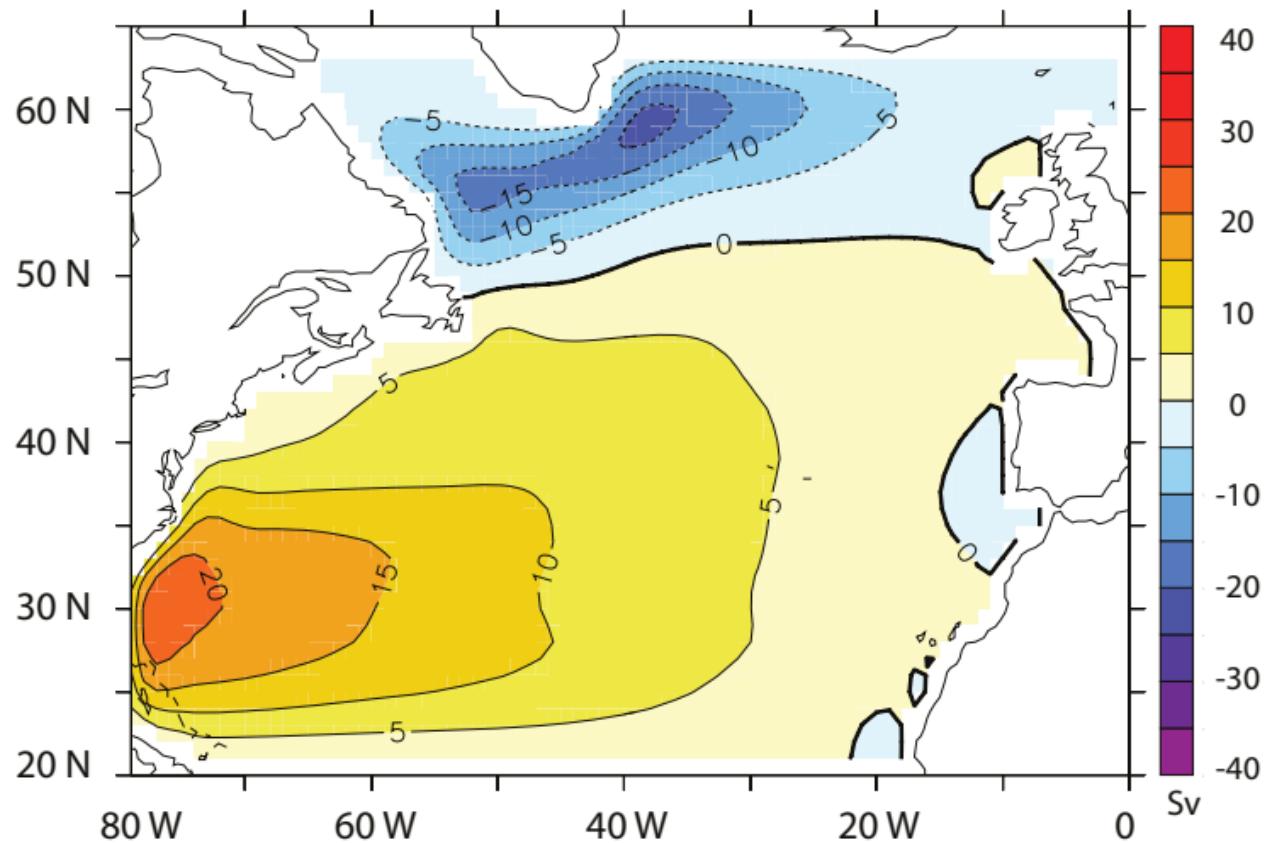


Fig. 19.8

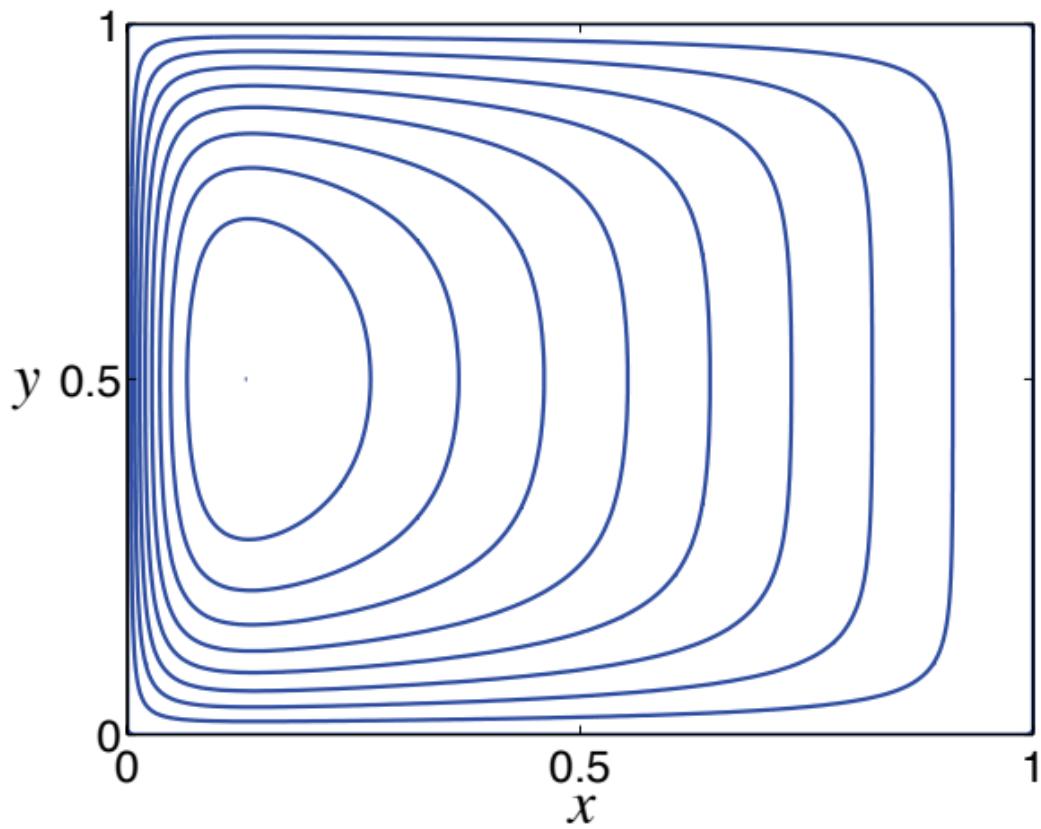
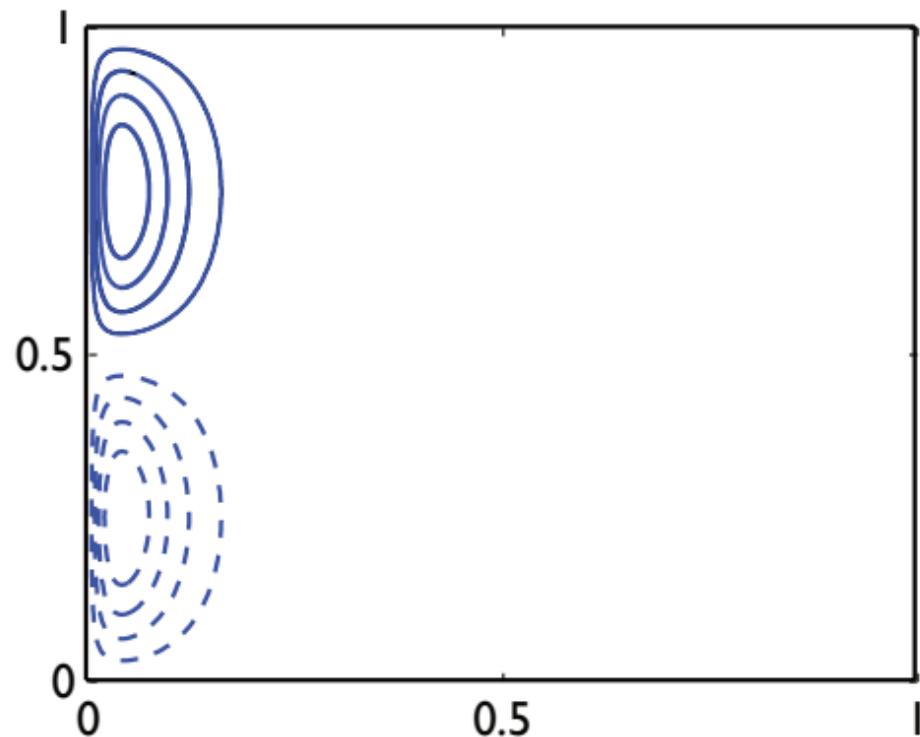


Fig. 19.9

Perturbation



Stommel + Perturbation

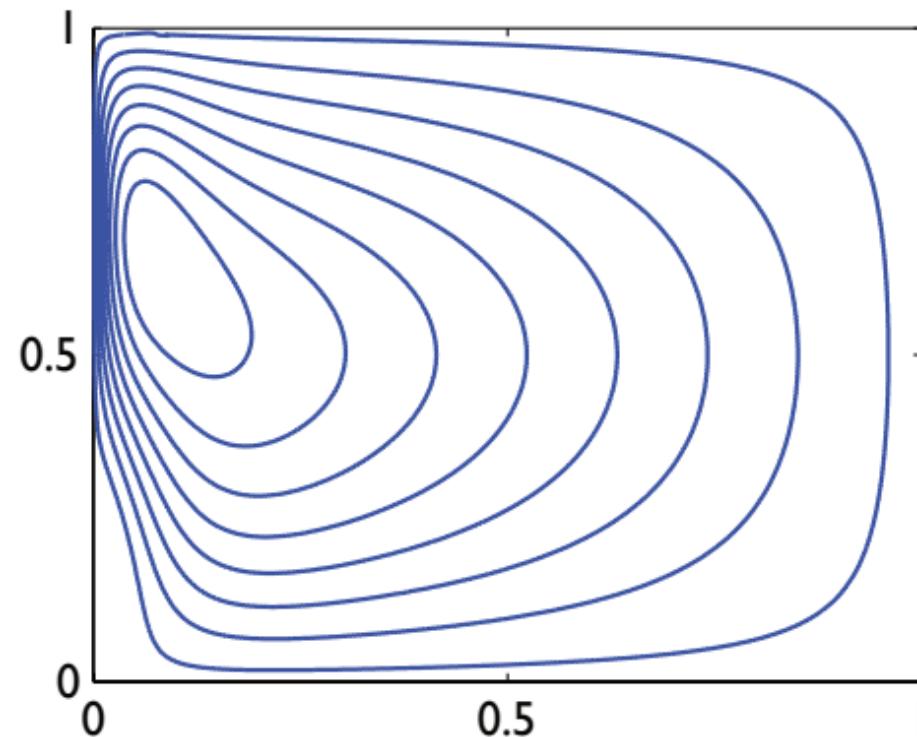


Fig. 19.10

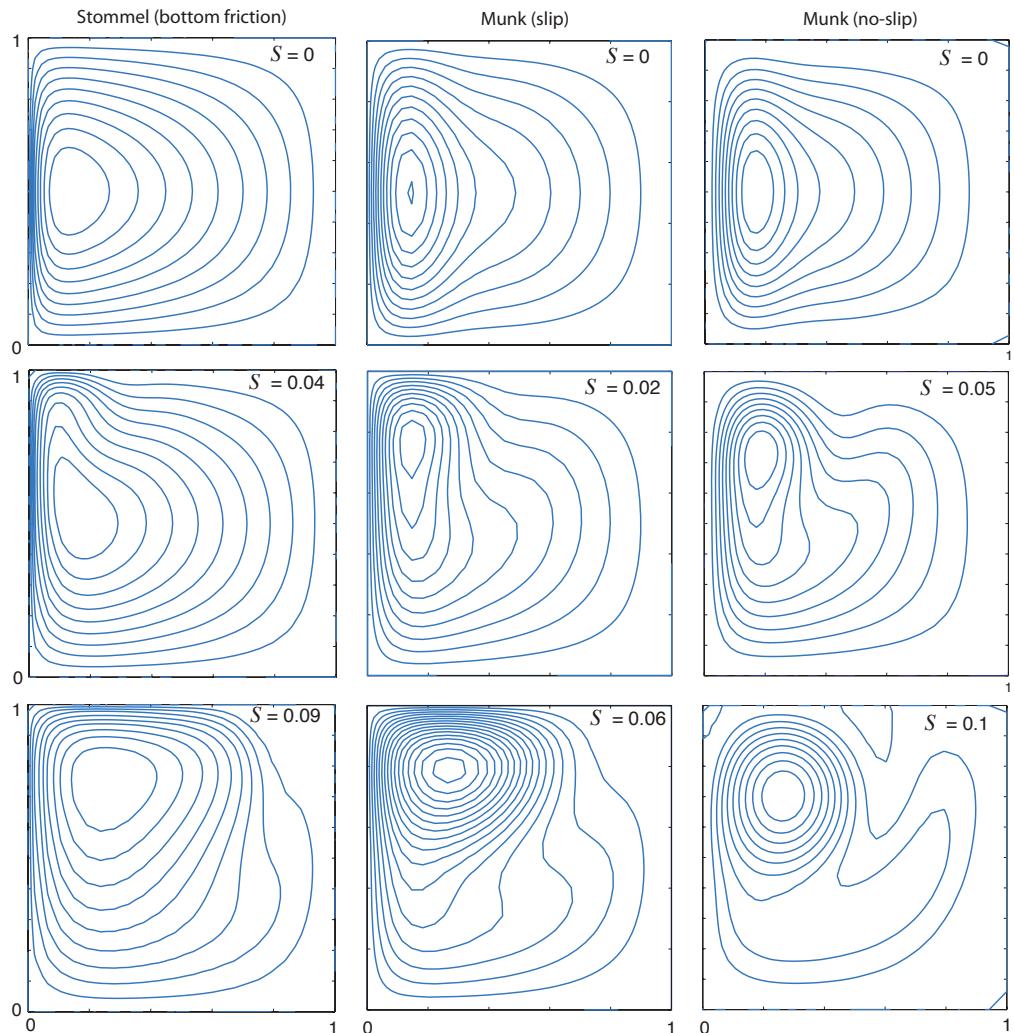


Fig. 19.11

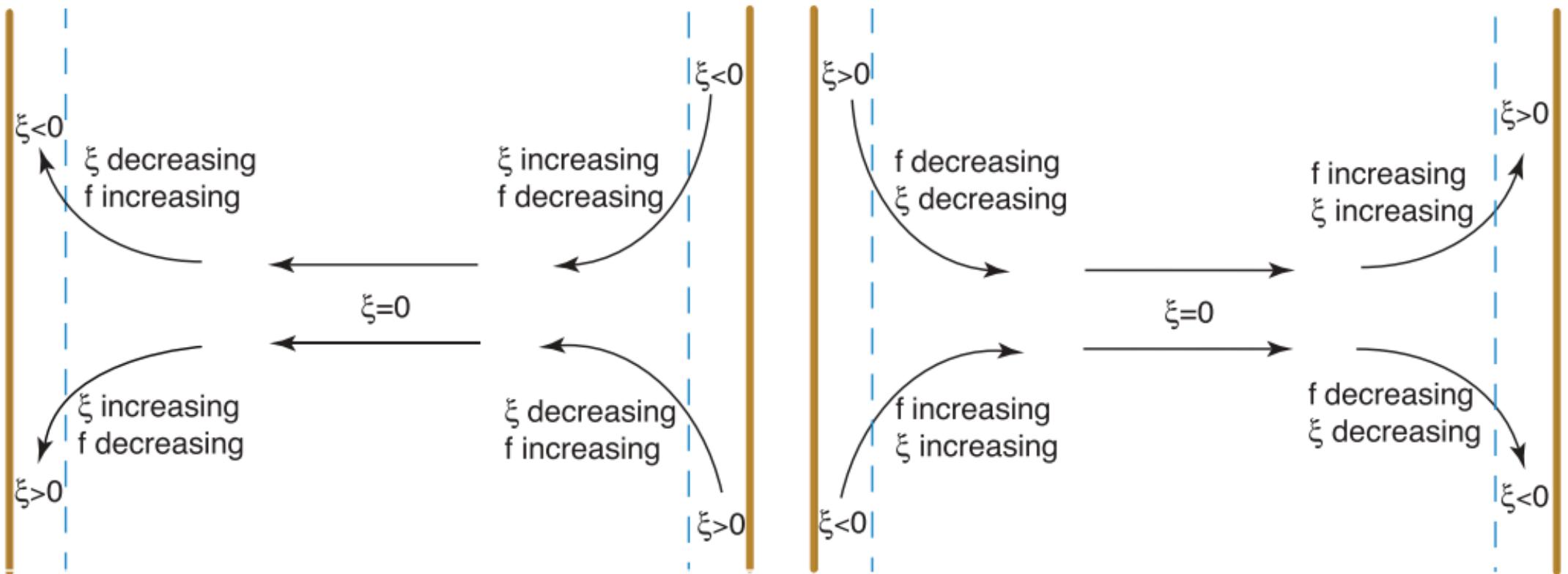


Fig. 19.12

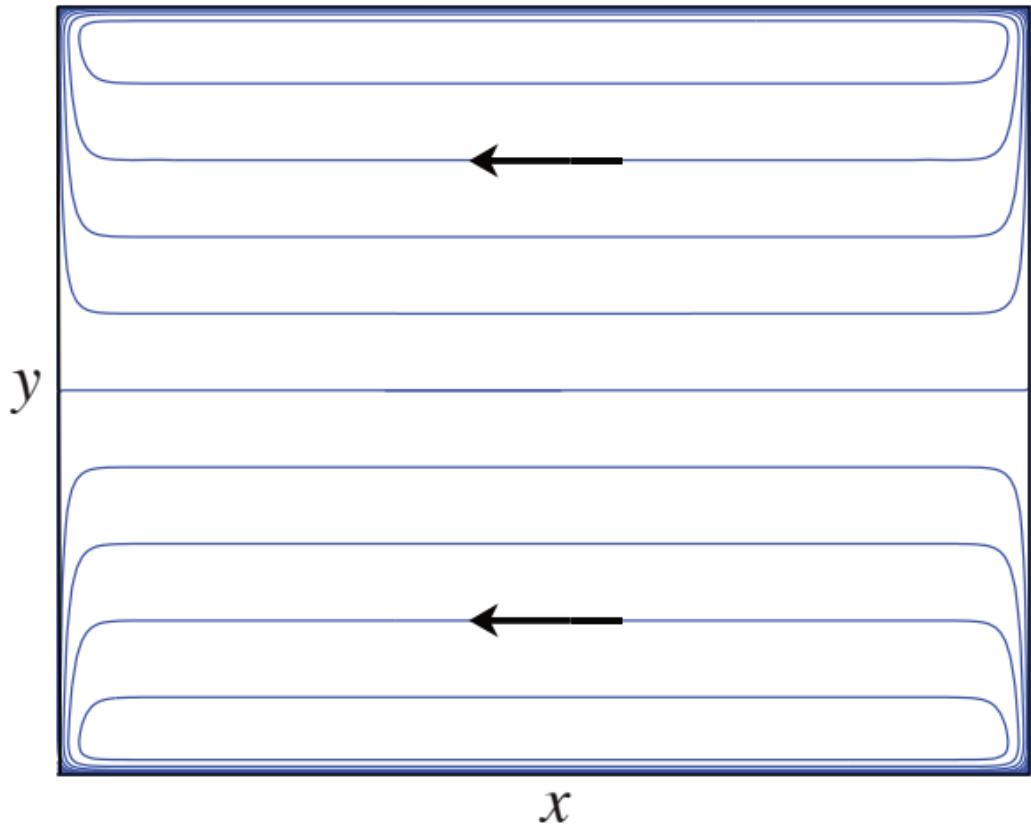


Fig. 19.13

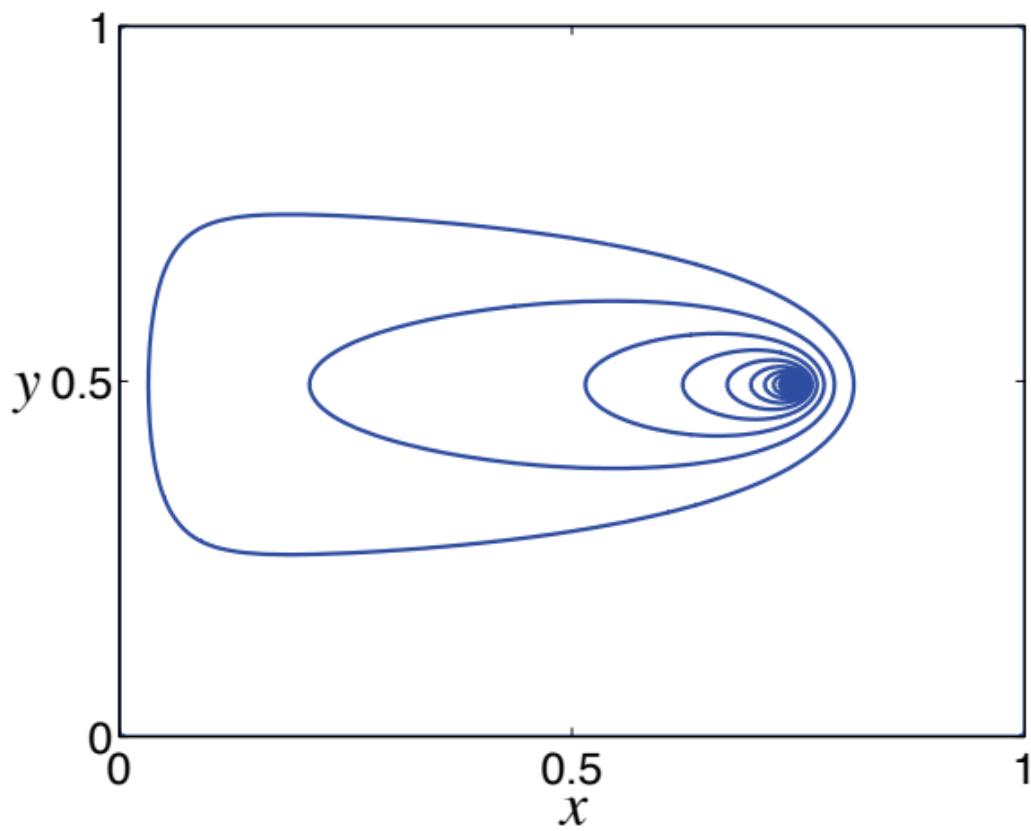


Fig. 19.14

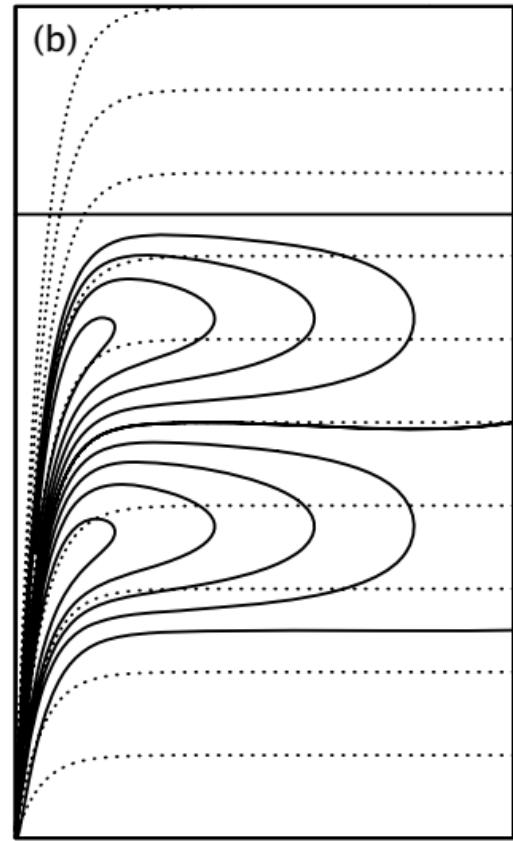
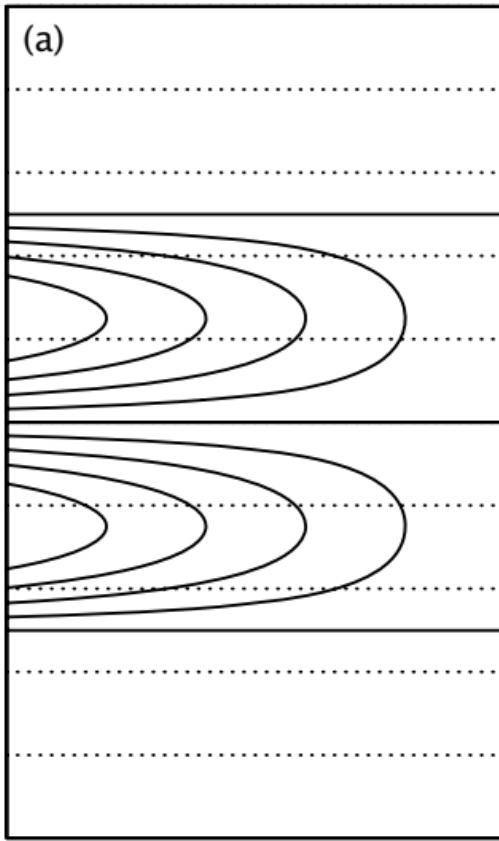
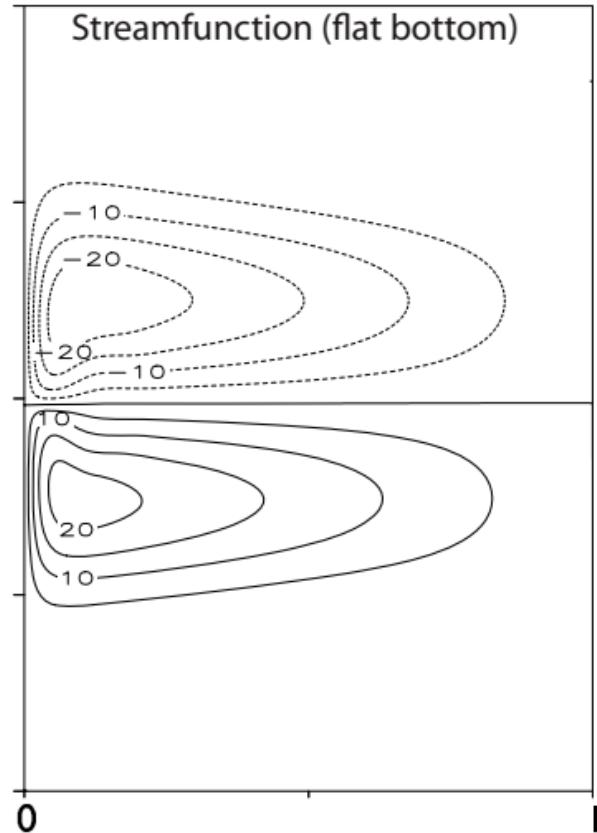
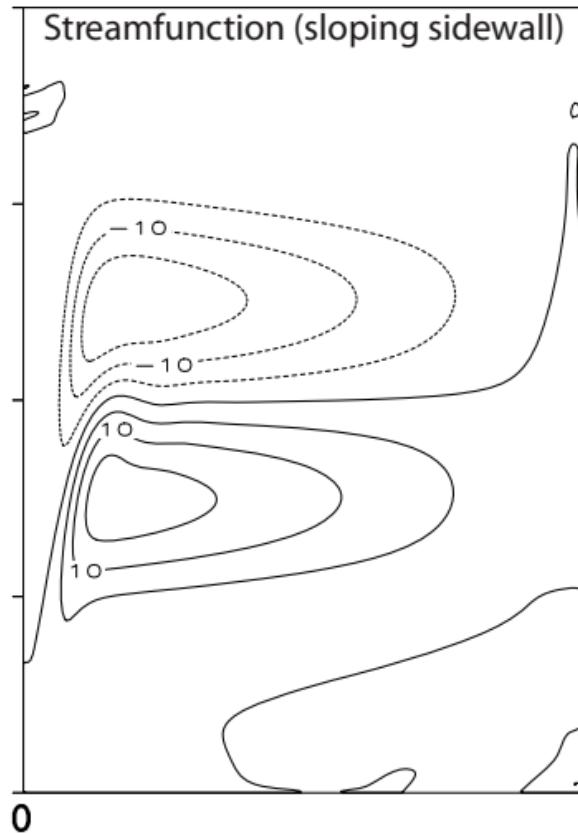


Fig. 19.15

Streamfunction (flat bottom)



Streamfunction (sloping sidewall)



Bottom pressure-stress curl (shaded)

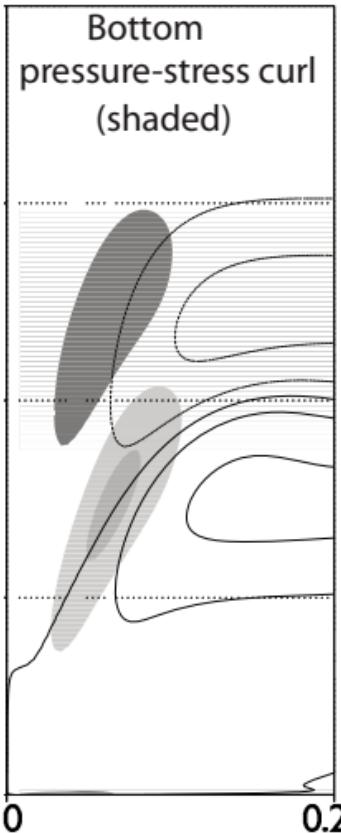


Fig. 19.16

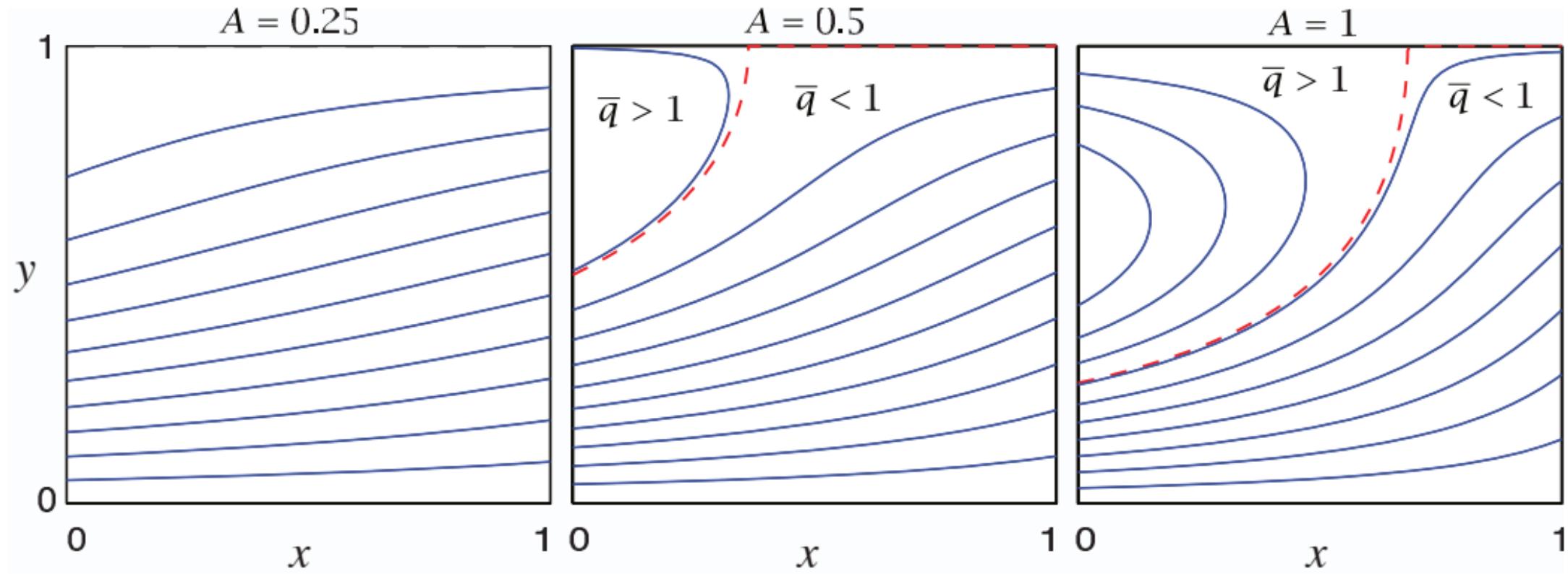


Fig. 20.1

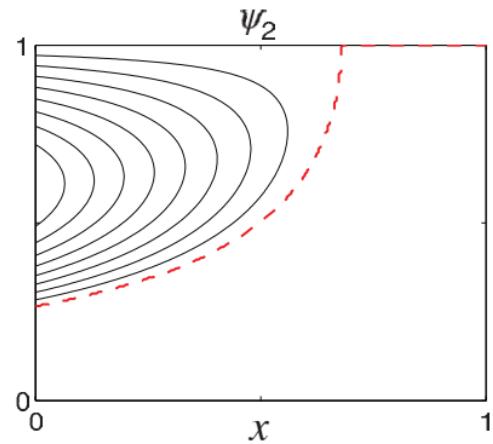
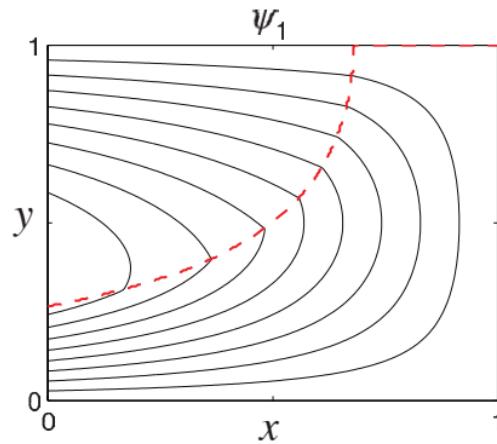
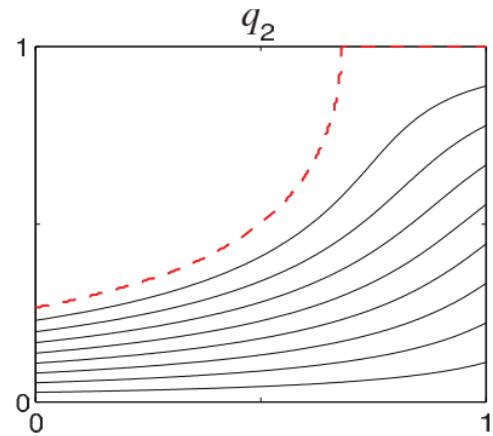
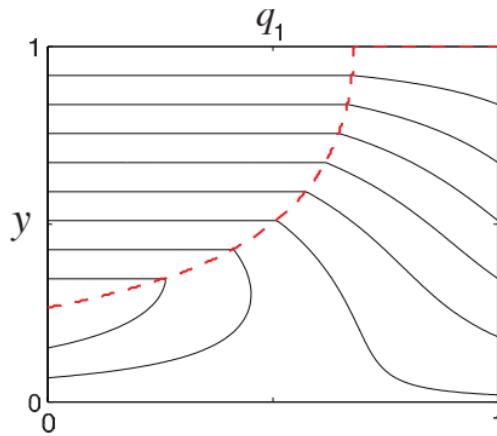


Fig. 20.2

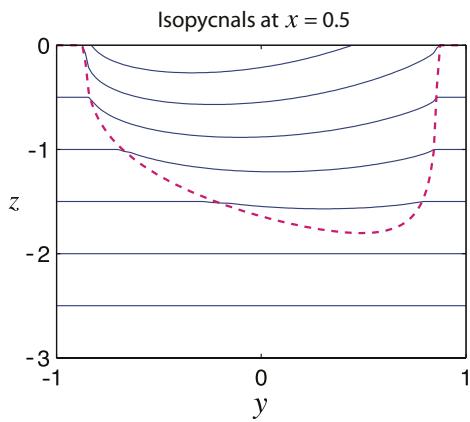
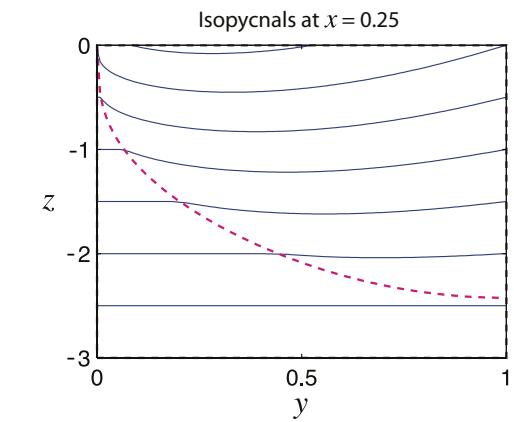
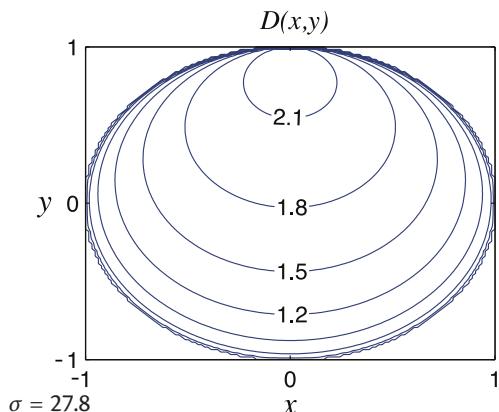
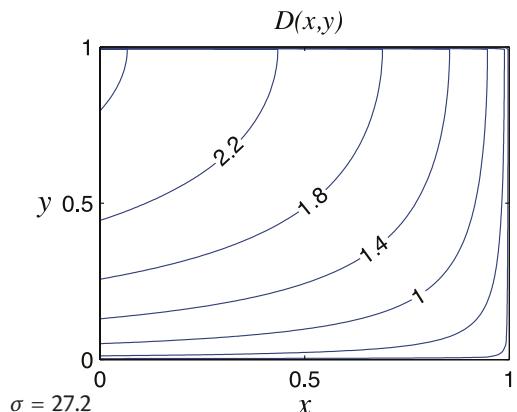
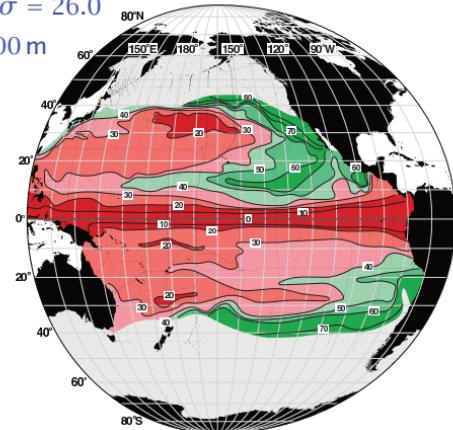
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Fig. 20.3

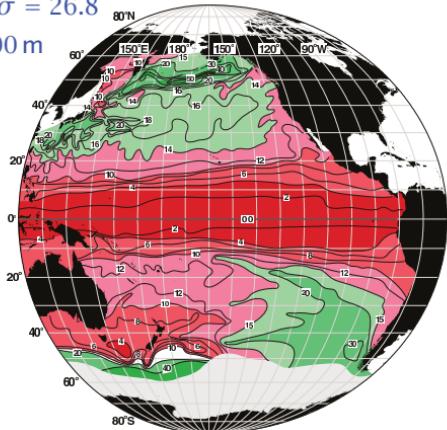
PV on $\sigma = 26.0$

$\bar{D} \approx 200 \text{ m}$



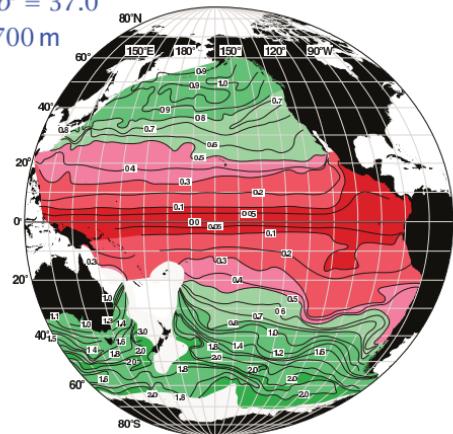
PV on $\sigma = 26.8$

$\bar{D} \approx 400 \text{ m}$



PV on $\sigma = 37.0$

$\bar{D} \approx 2700 \text{ m}$



PV on $\sigma = 26.8$

$\bar{D} \approx 350 \text{ m}$

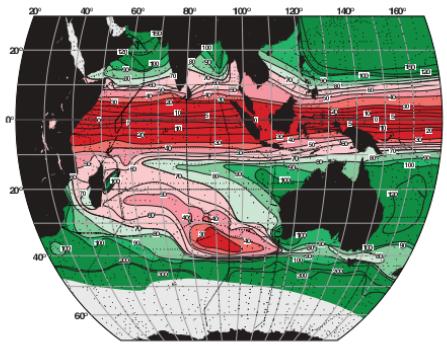


Fig. 20.4

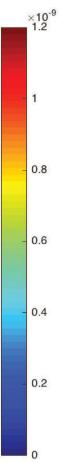
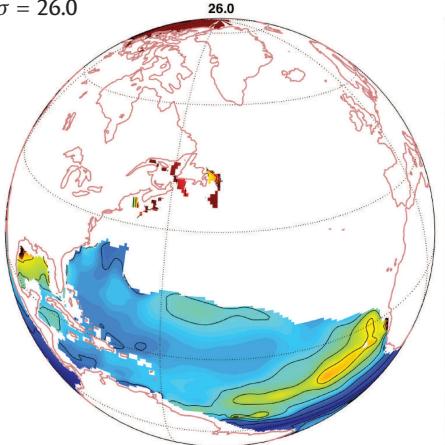
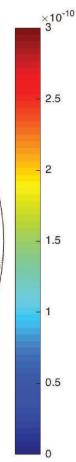
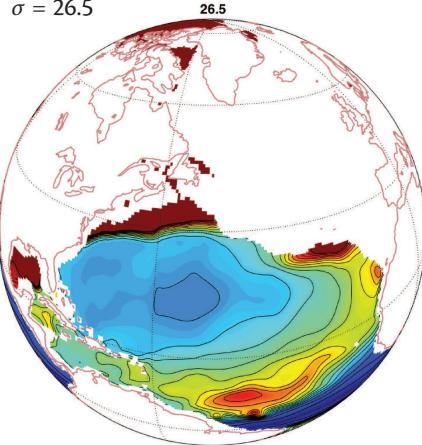
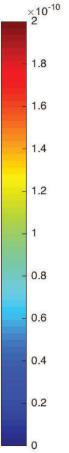
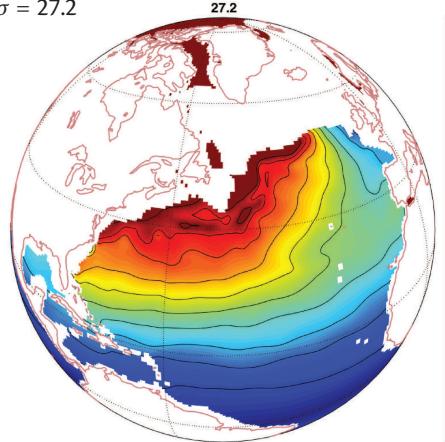
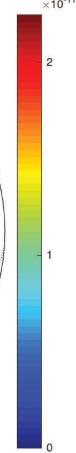
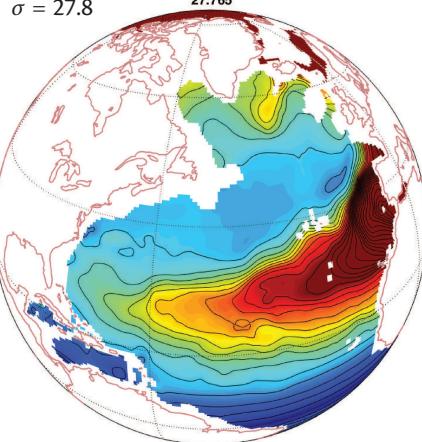
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Fig. 20.5

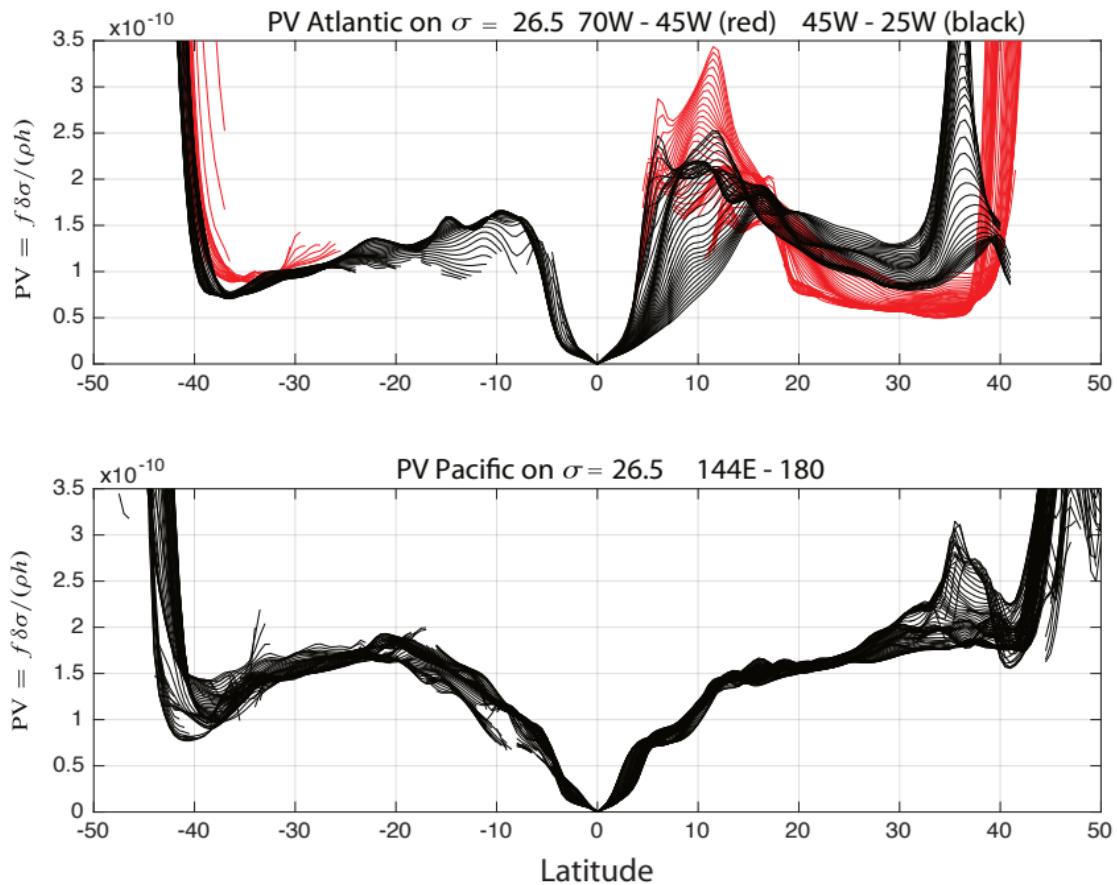


Fig. 20.6

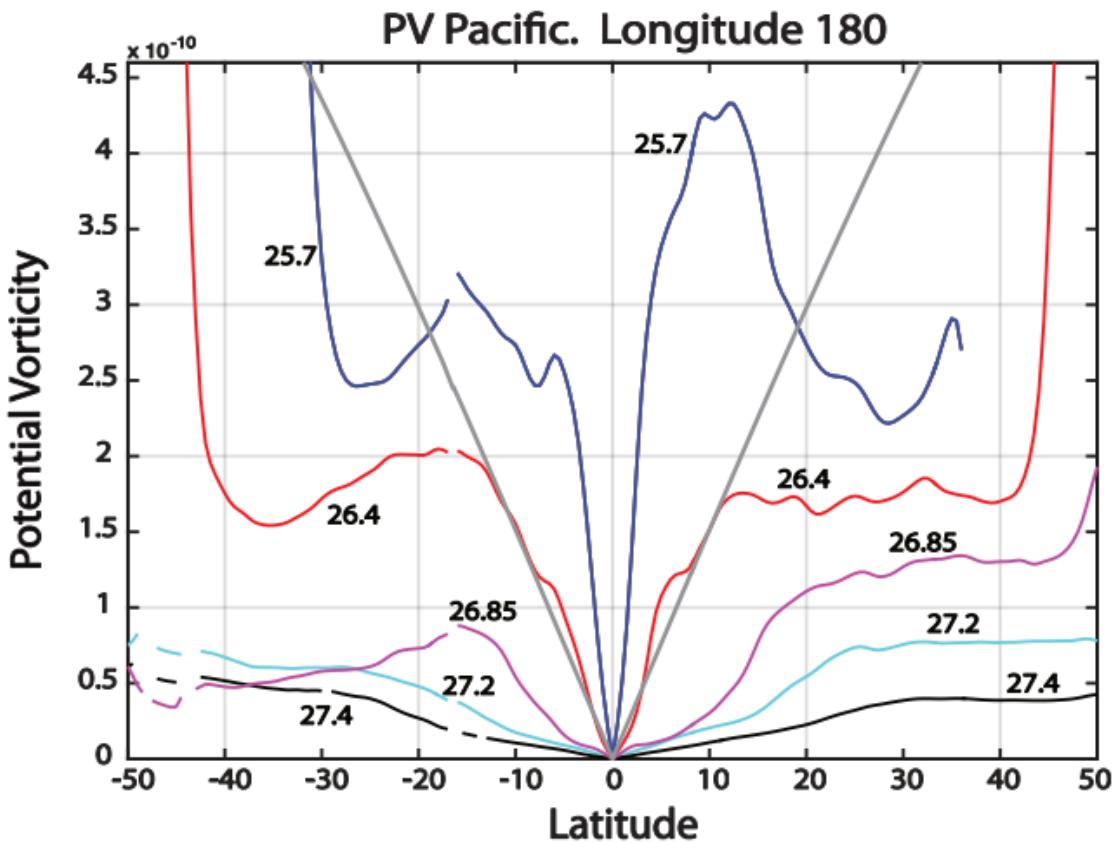


Fig. 20.7

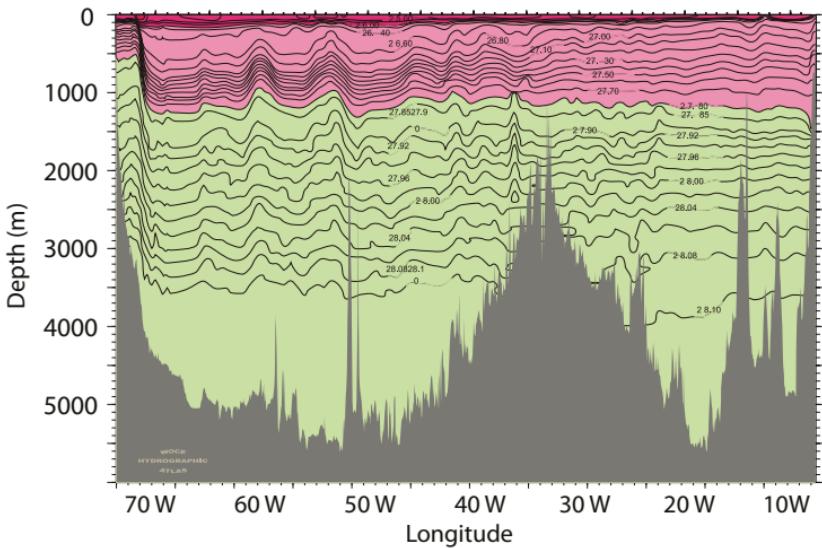
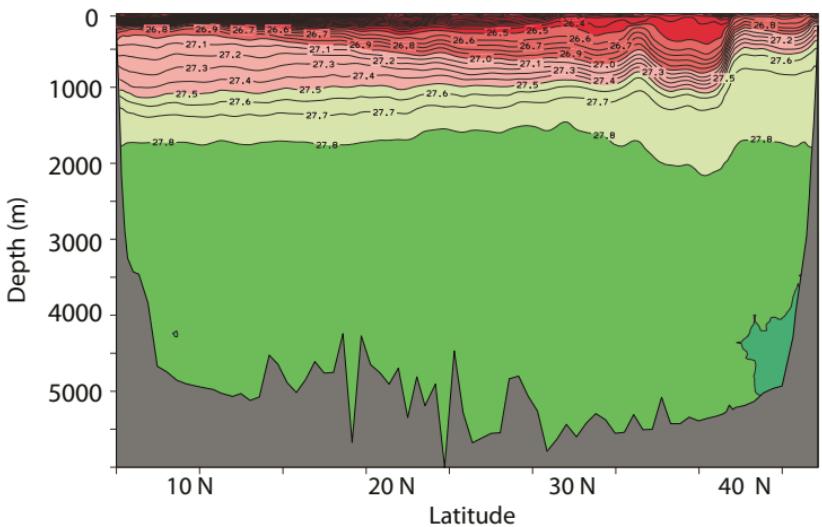


Fig. 20.8

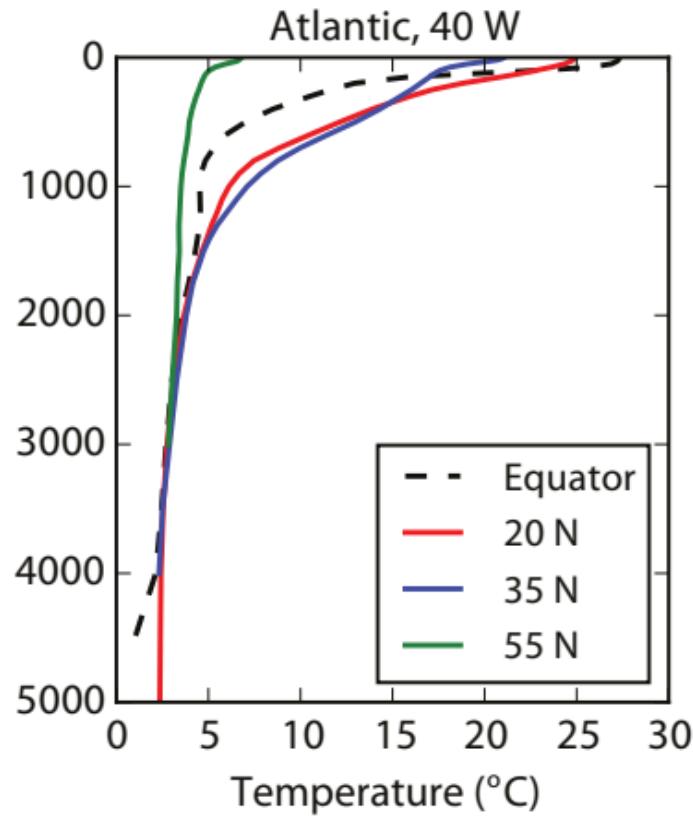
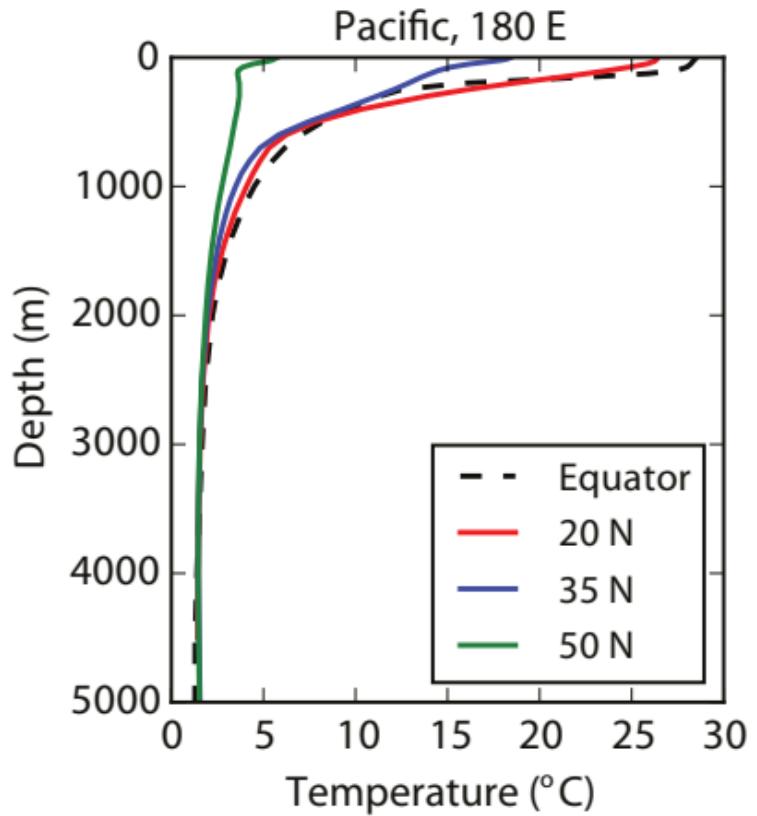


Fig. 20.9

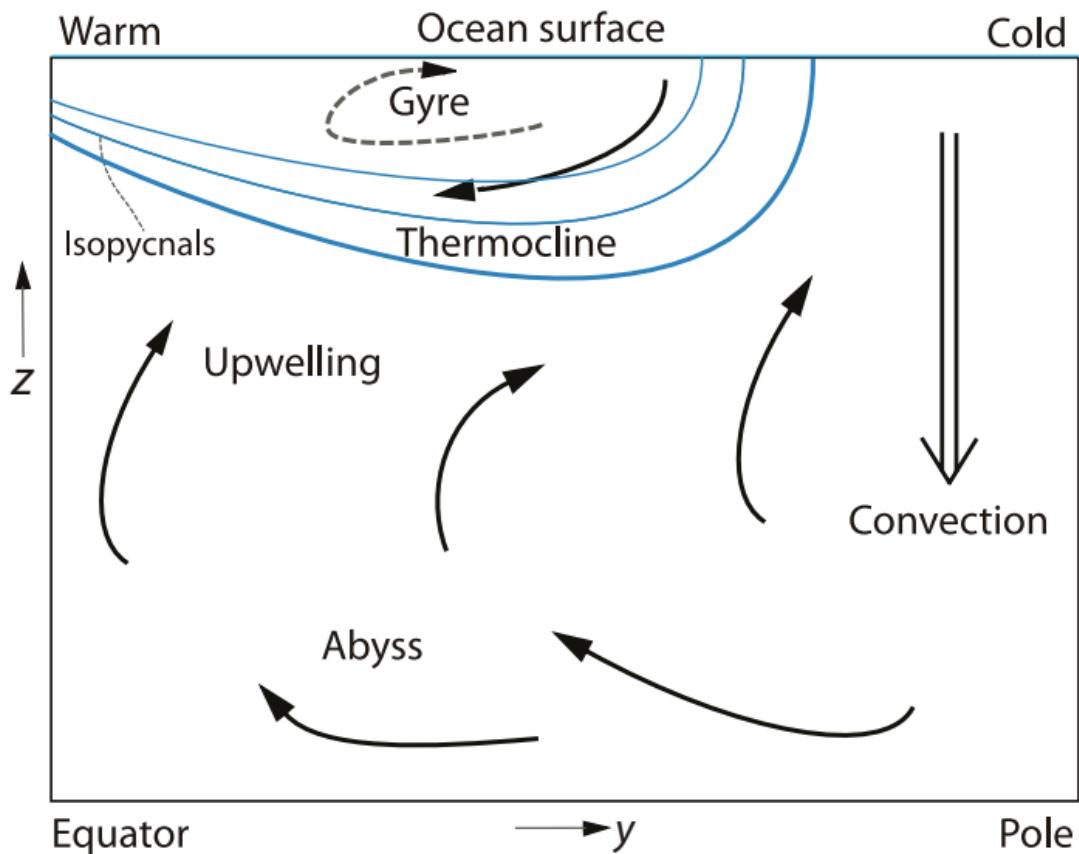


Fig. 20.10

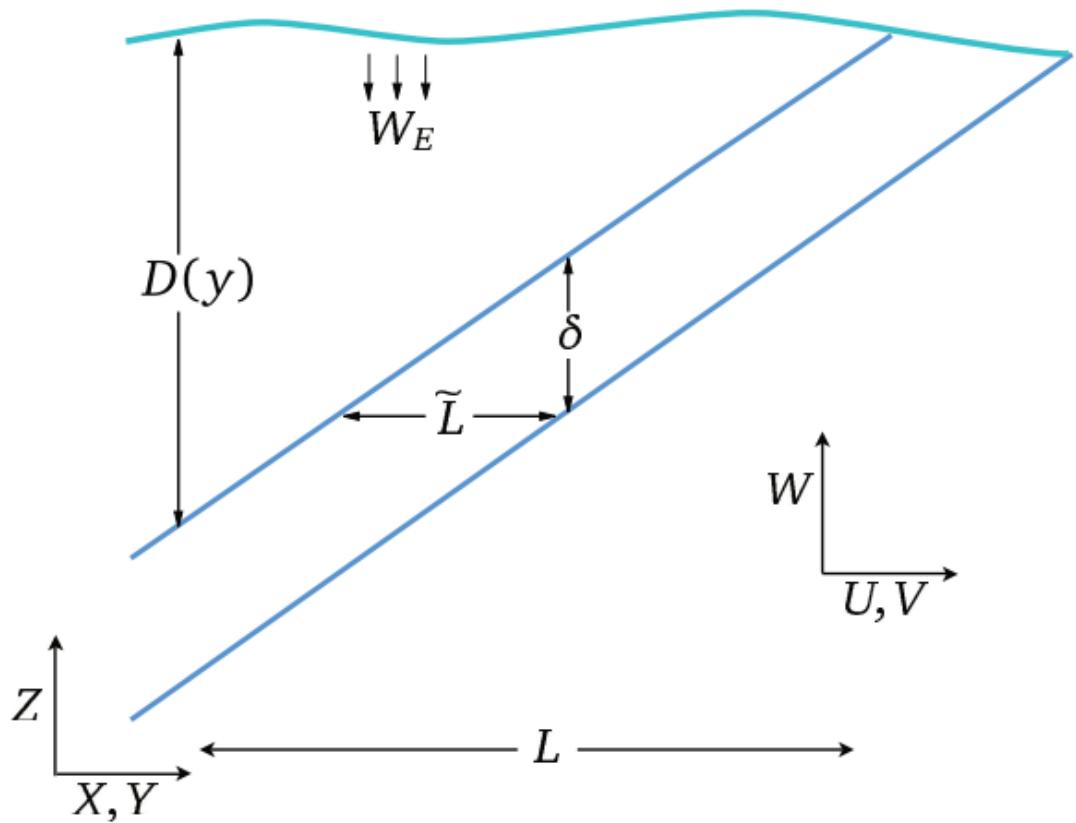


Fig. 20.11

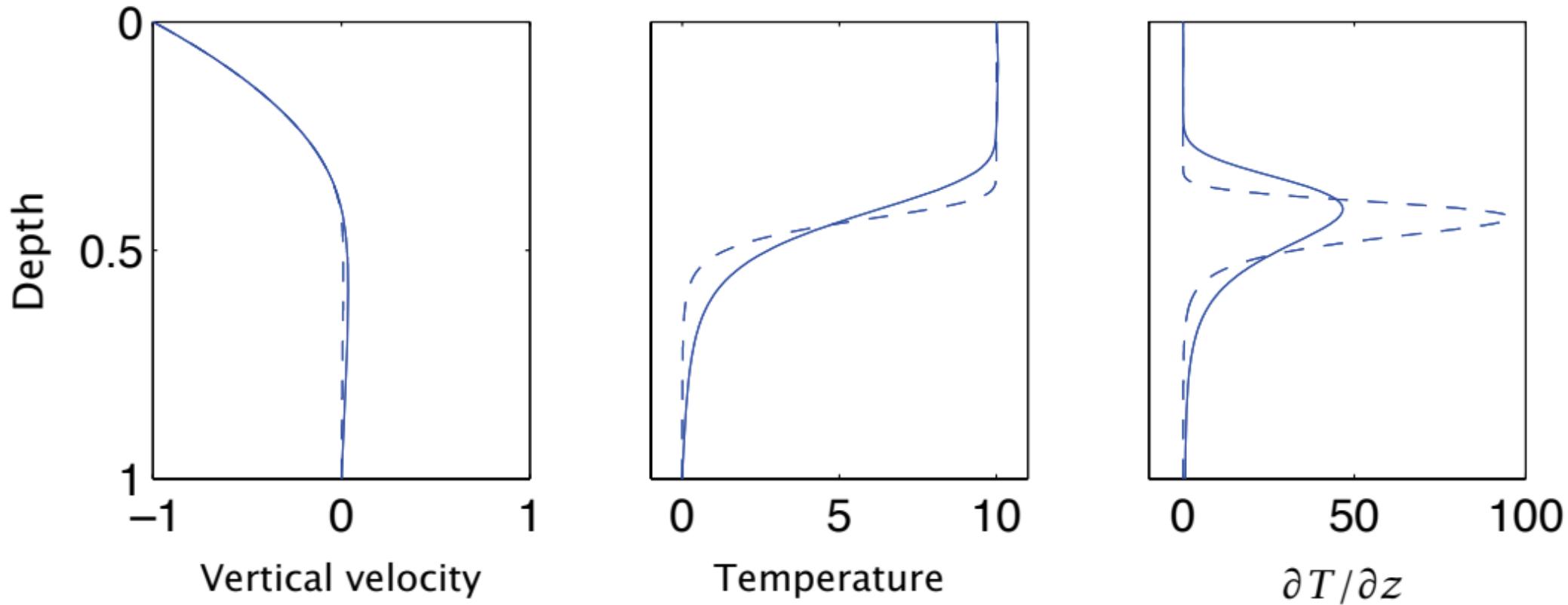


Fig. 20.12

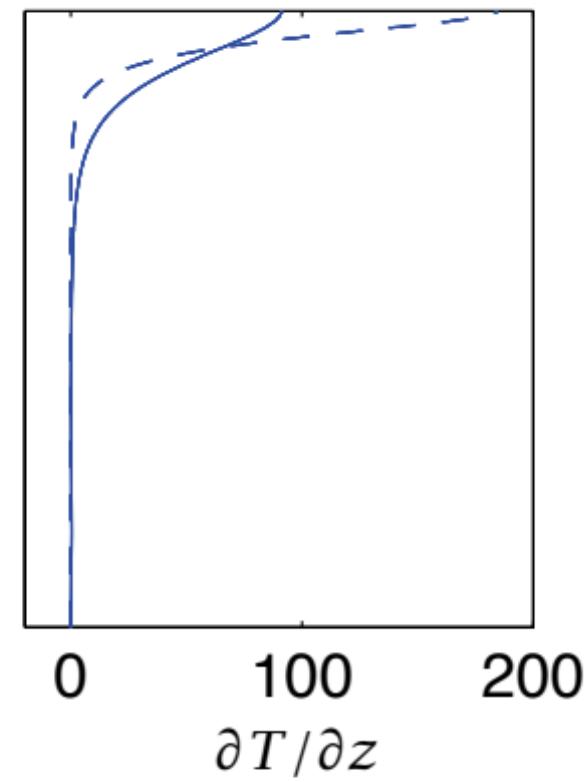
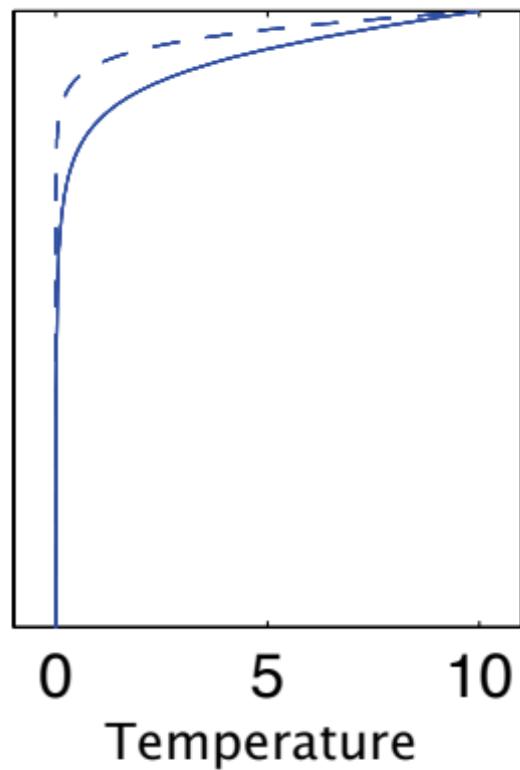
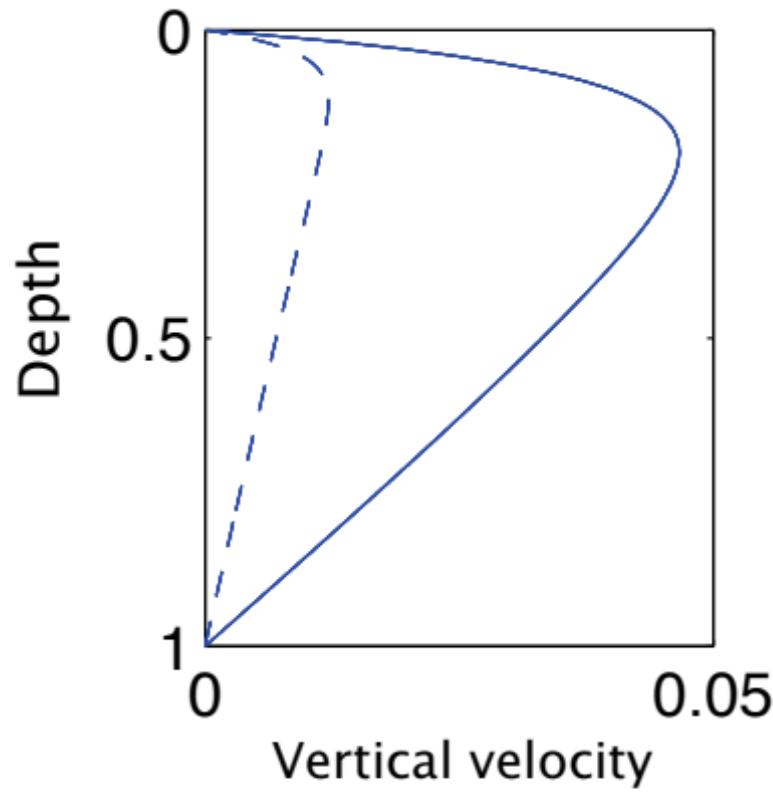


Fig. 20.13

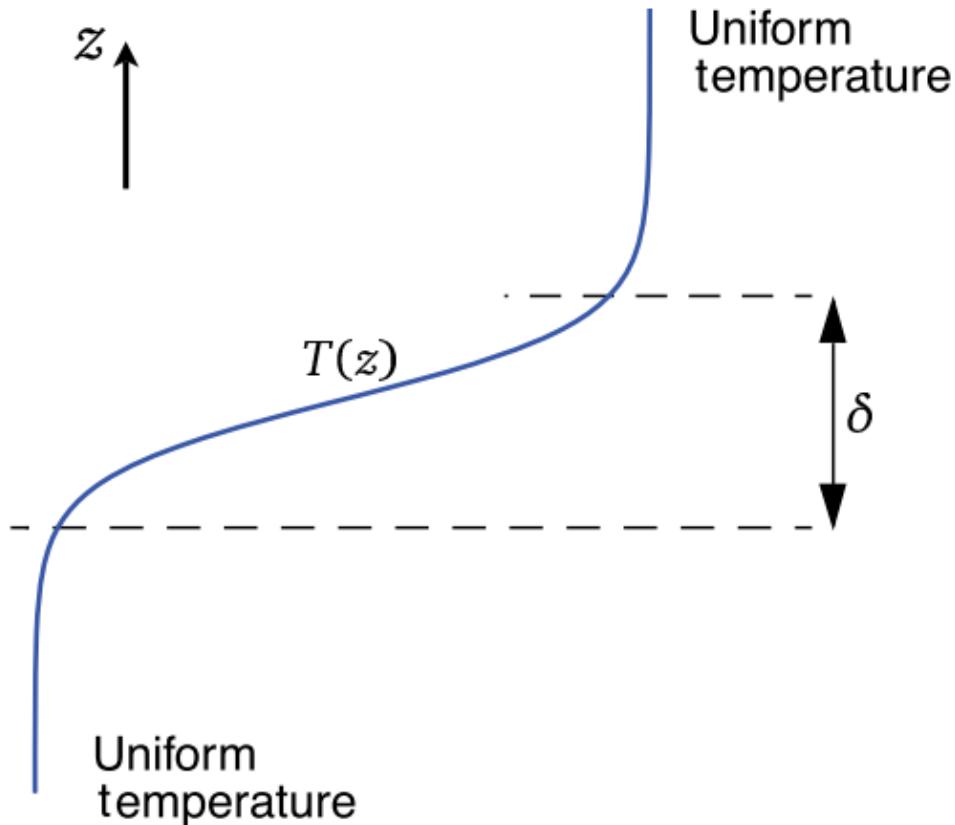
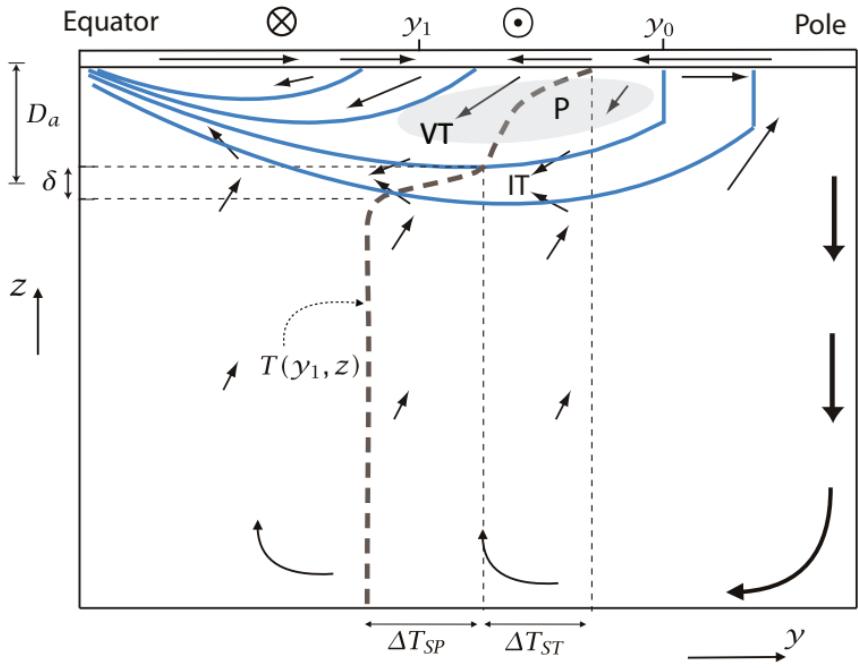


Fig. 20.14



Key: VT – ventilated thermocline. IT – internal thermocline. P – pool region in west. δ – thickness of the internal thermocline. D_a – depth of the ventilated thermocline. ΔT_{ST} – temperature drop across subtropical gyre and across ventilated thermocline. ΔT_{SP} – temperature drop across the subpolar gyre and internal thermocline. y_0 – subtropical-subpolar gyre boundary. y_1 – a latitude in the subtropical gyre.

Fig. 20.15

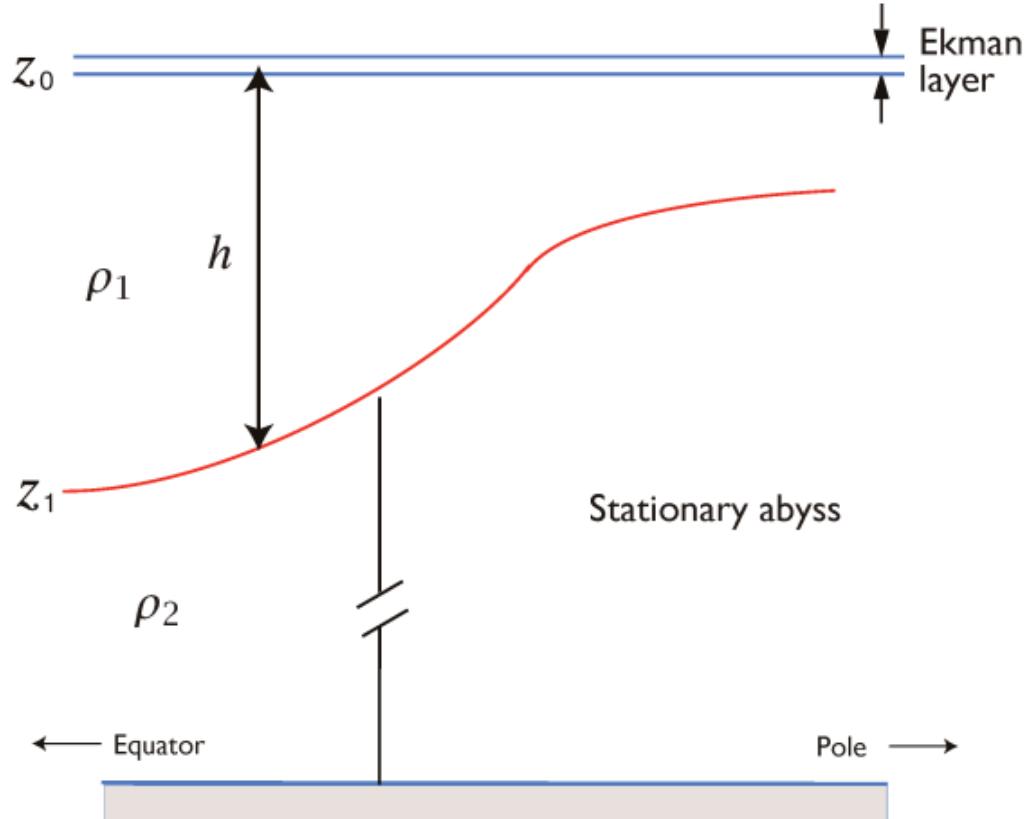


Fig. 20.16

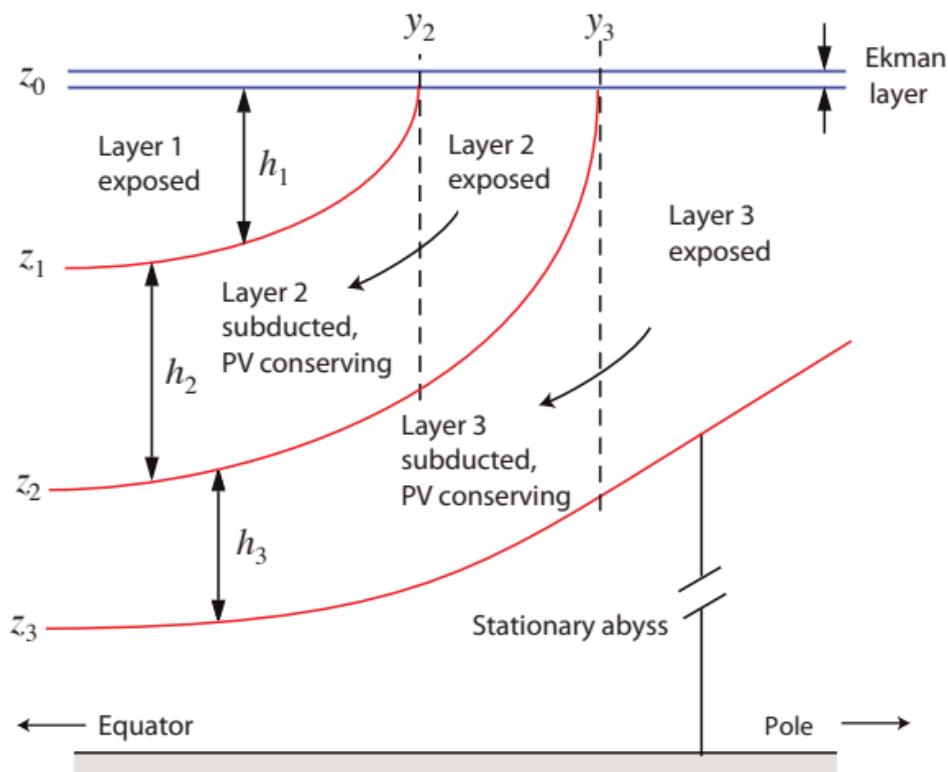
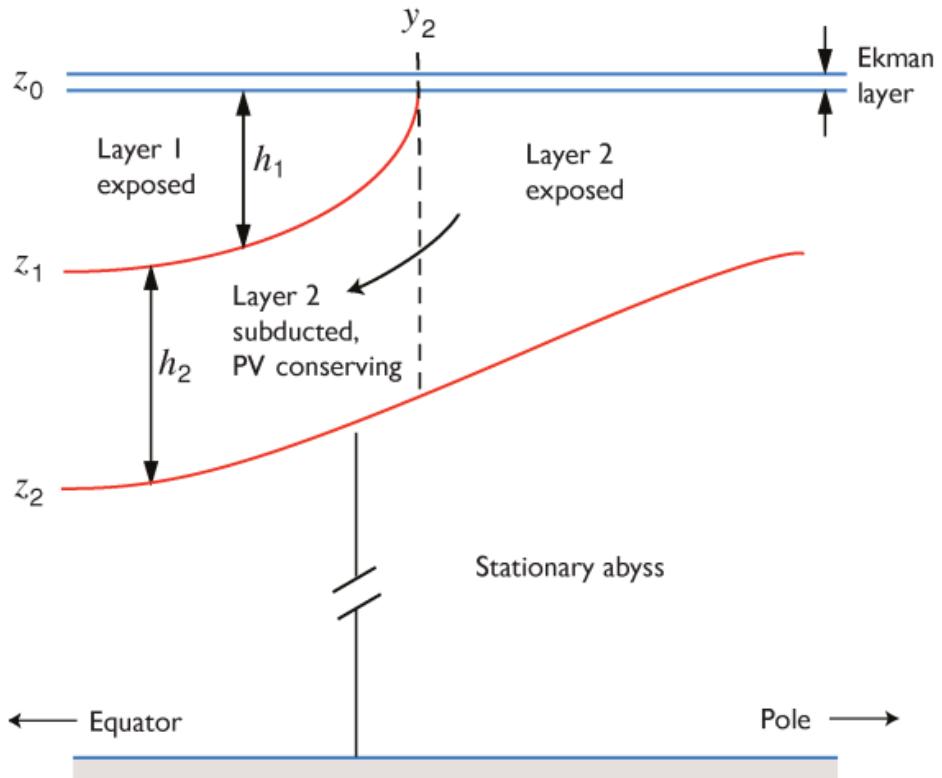
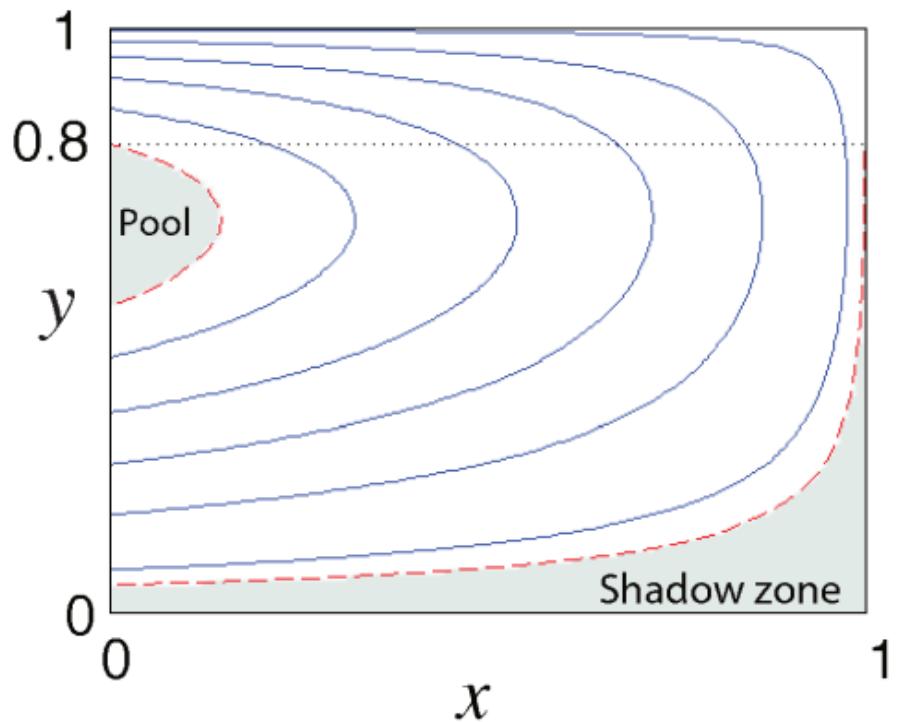


Fig. 20.17

Total thickness



Upper-layer thickness

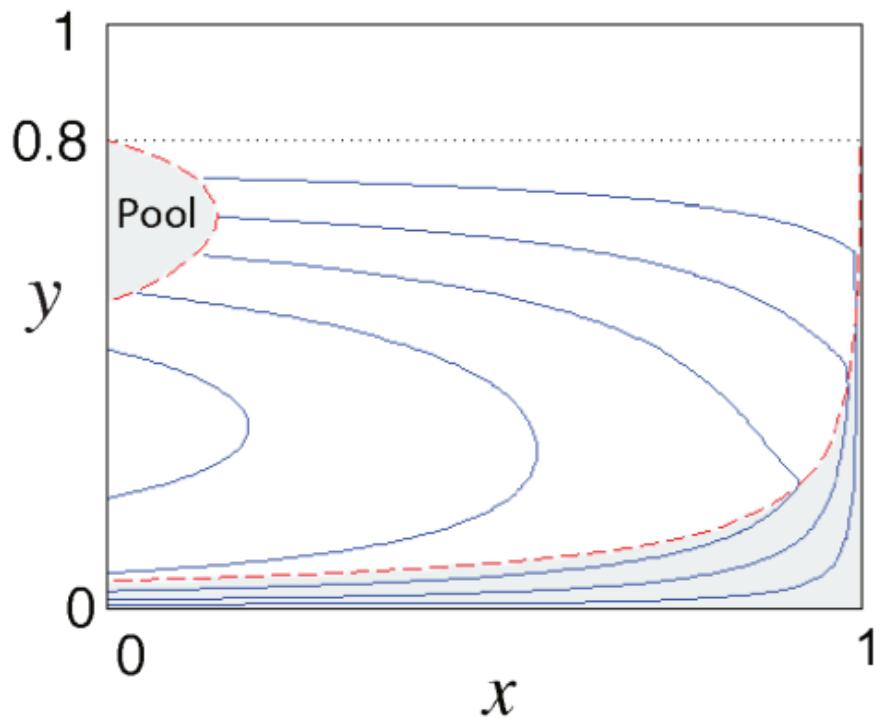


Fig. 20.18

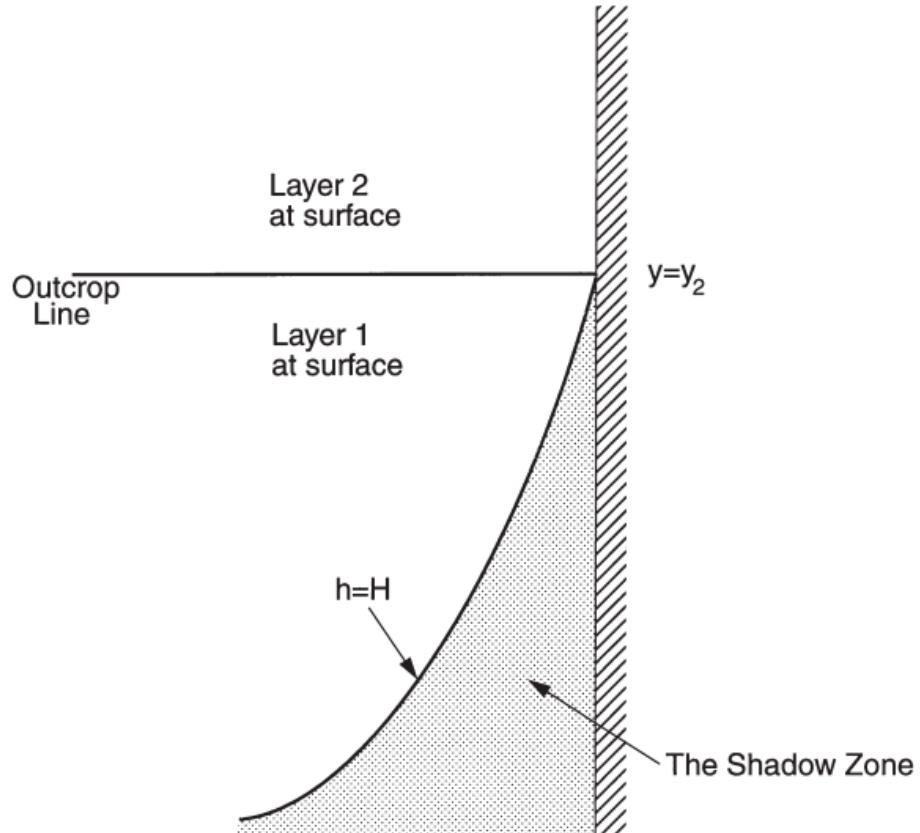
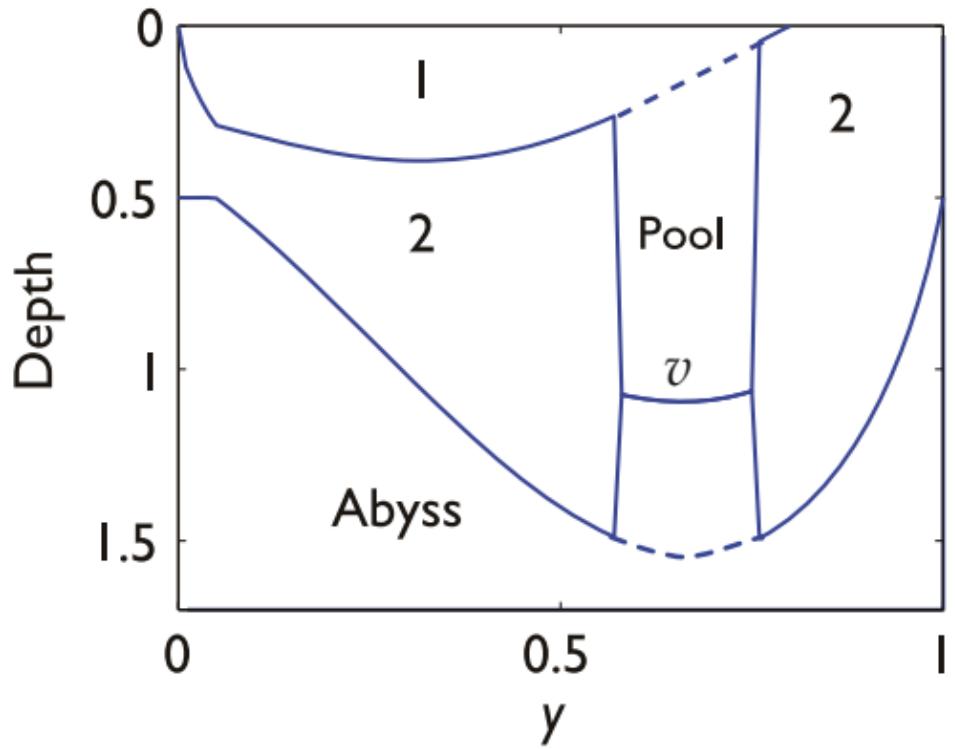


Fig. 20.19

Section at $x = 0.1$



Section at $x = 0.75$

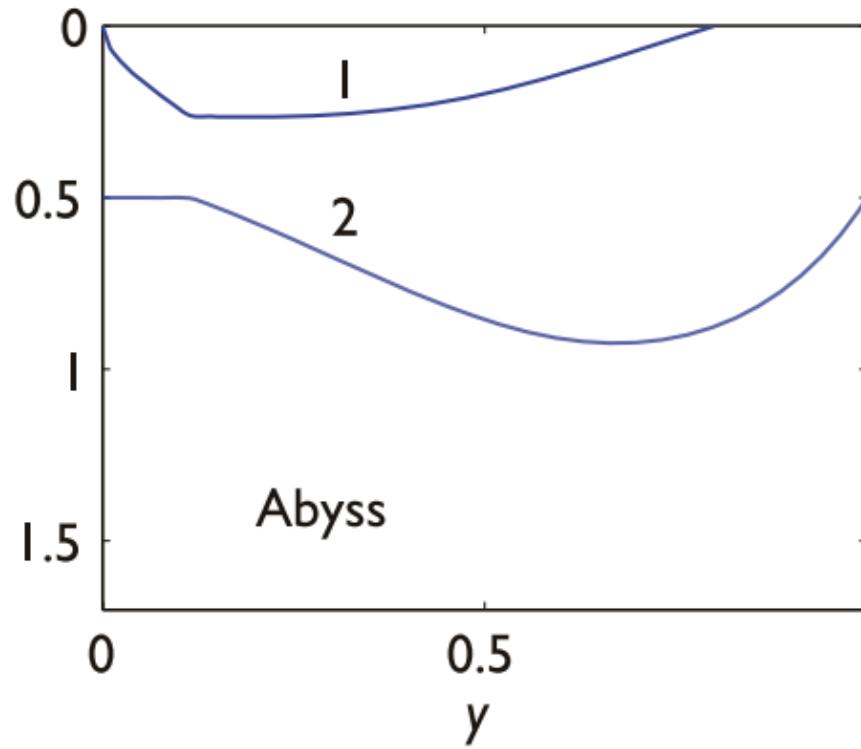


Fig. 20.20

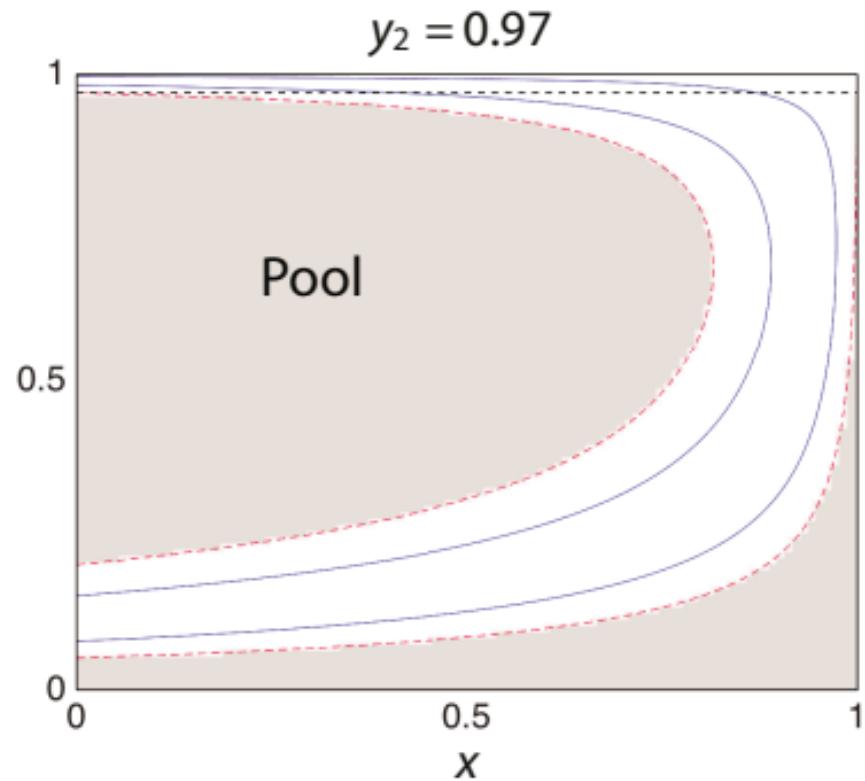
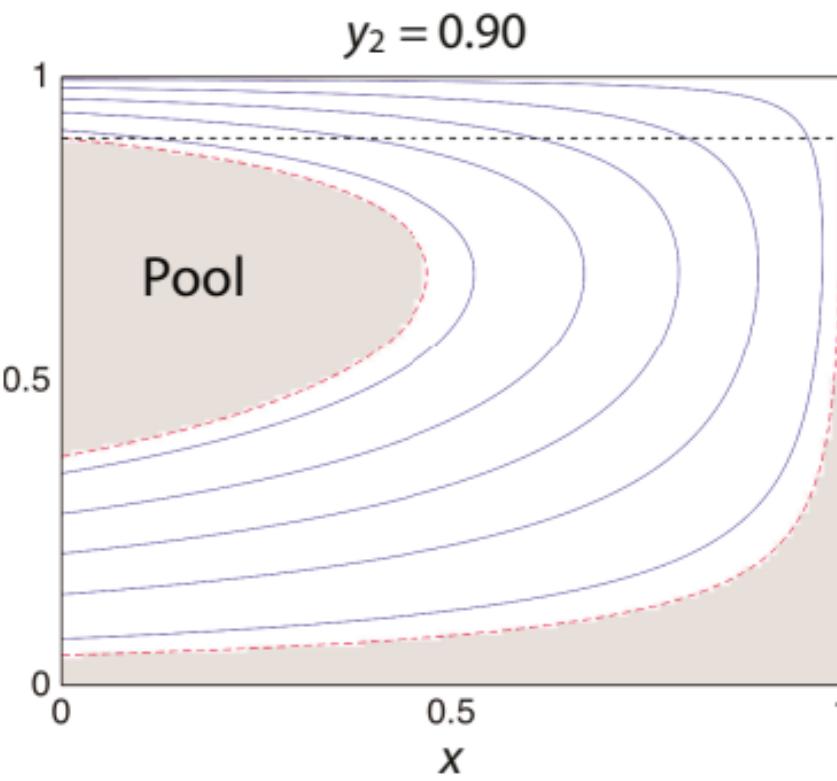
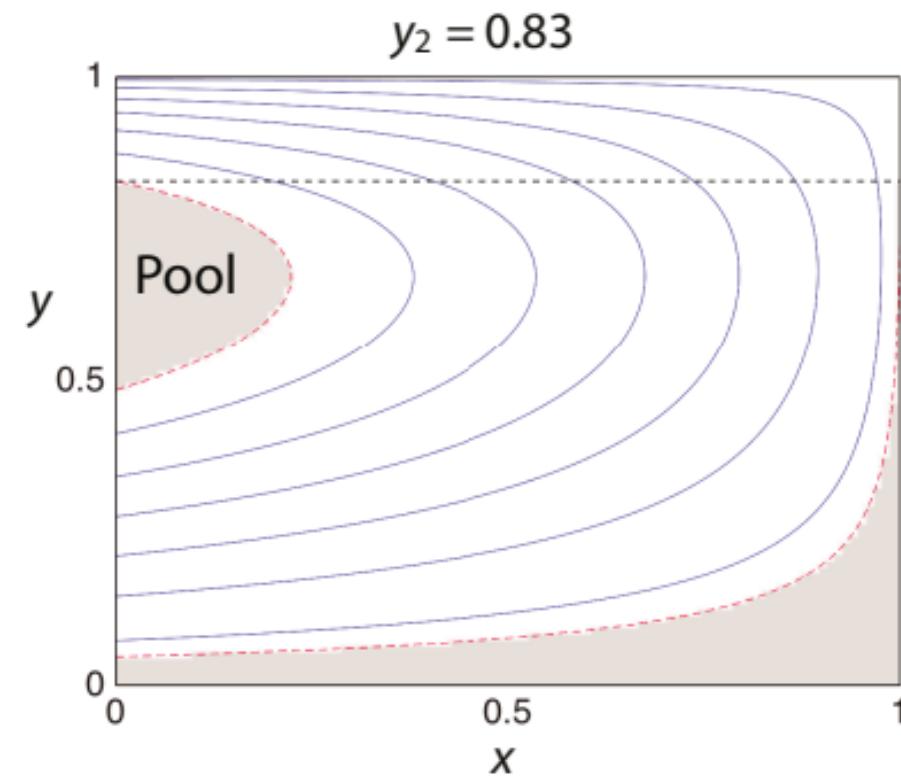


Fig. 20.21

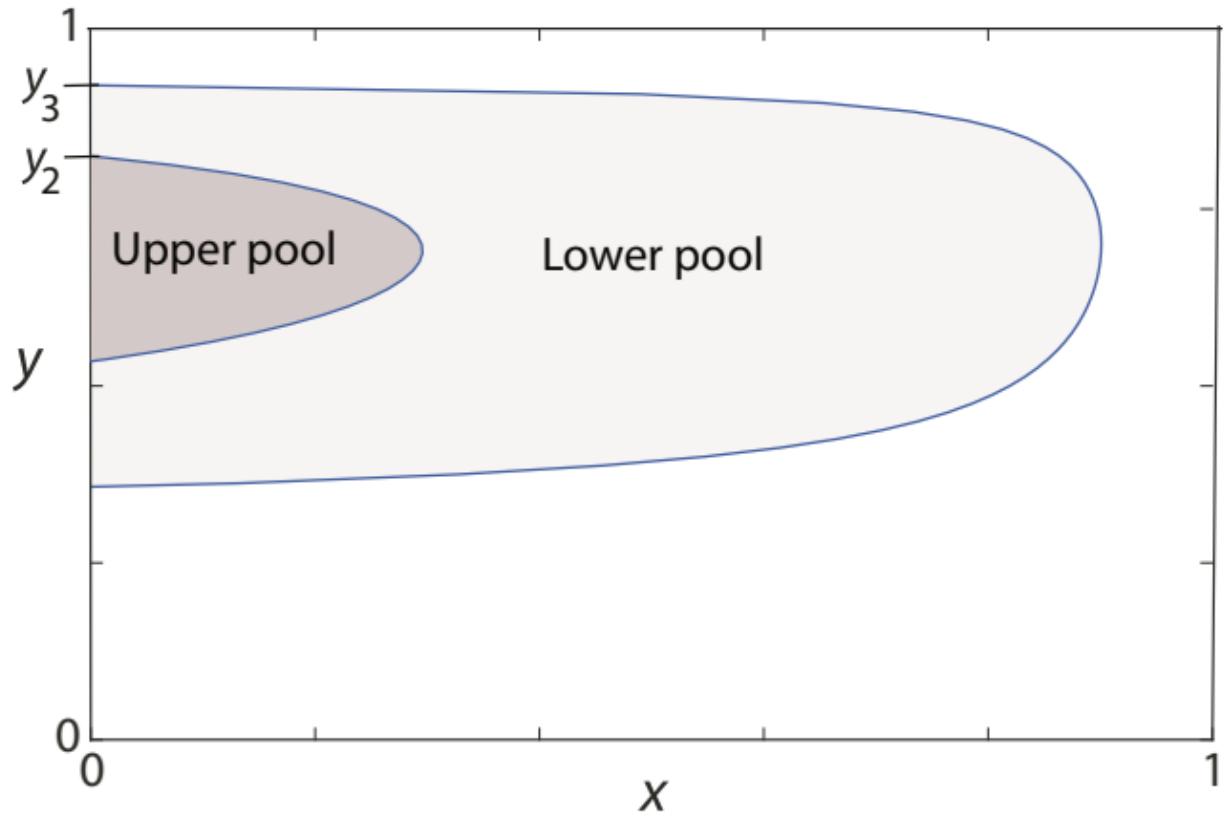


Fig. 20.22

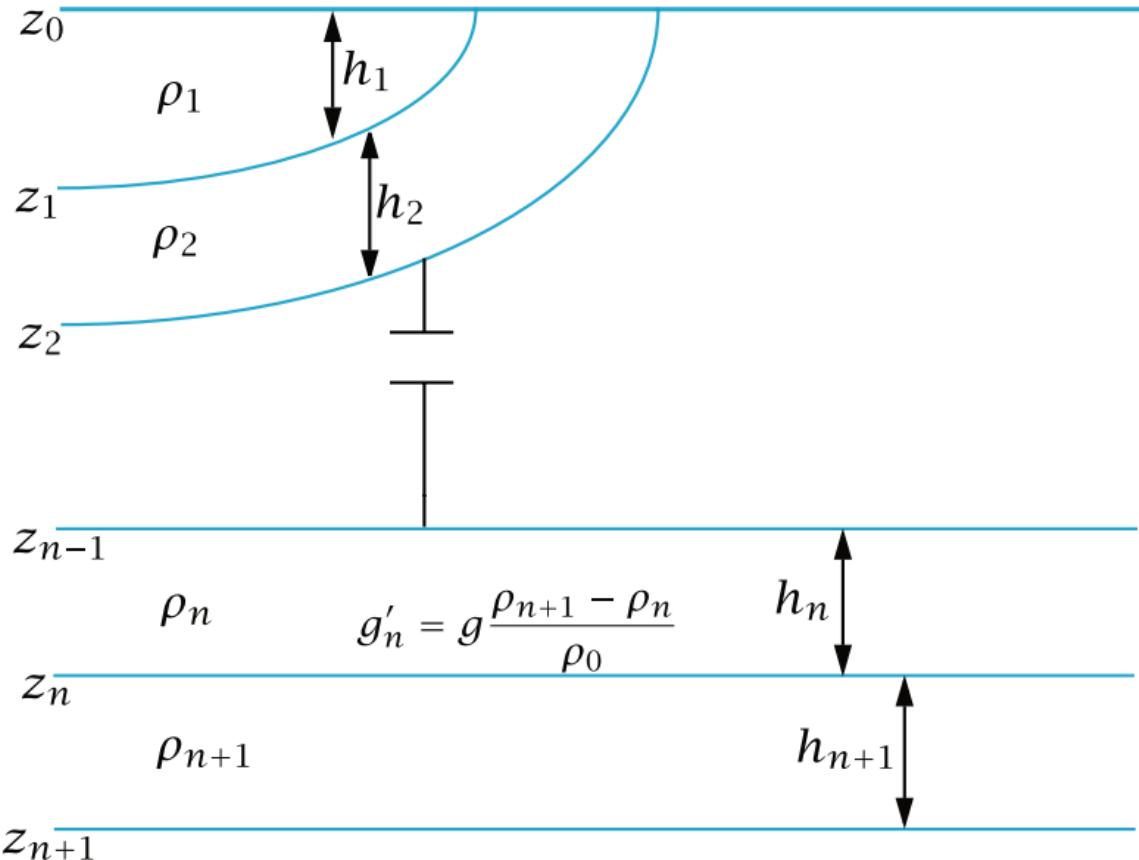


Fig. 20.23

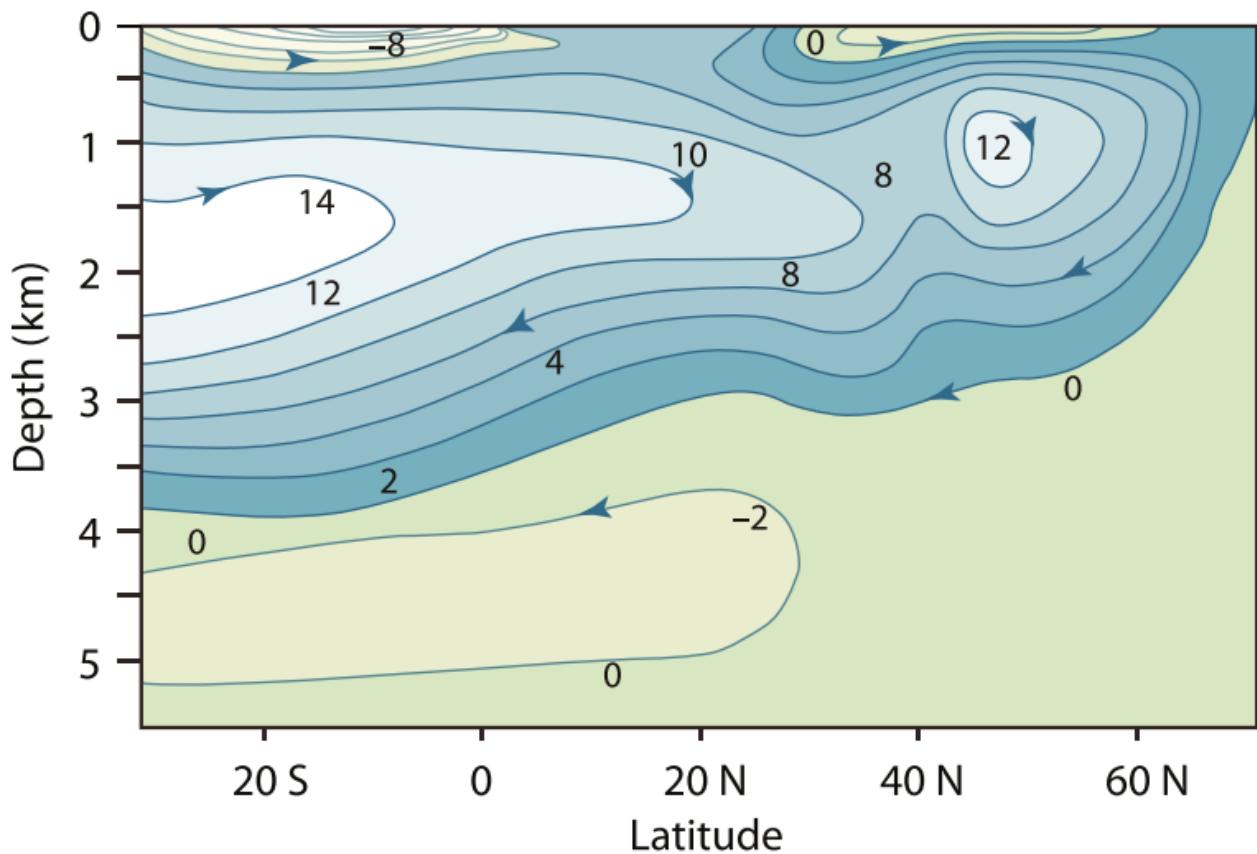


Fig. 21.1

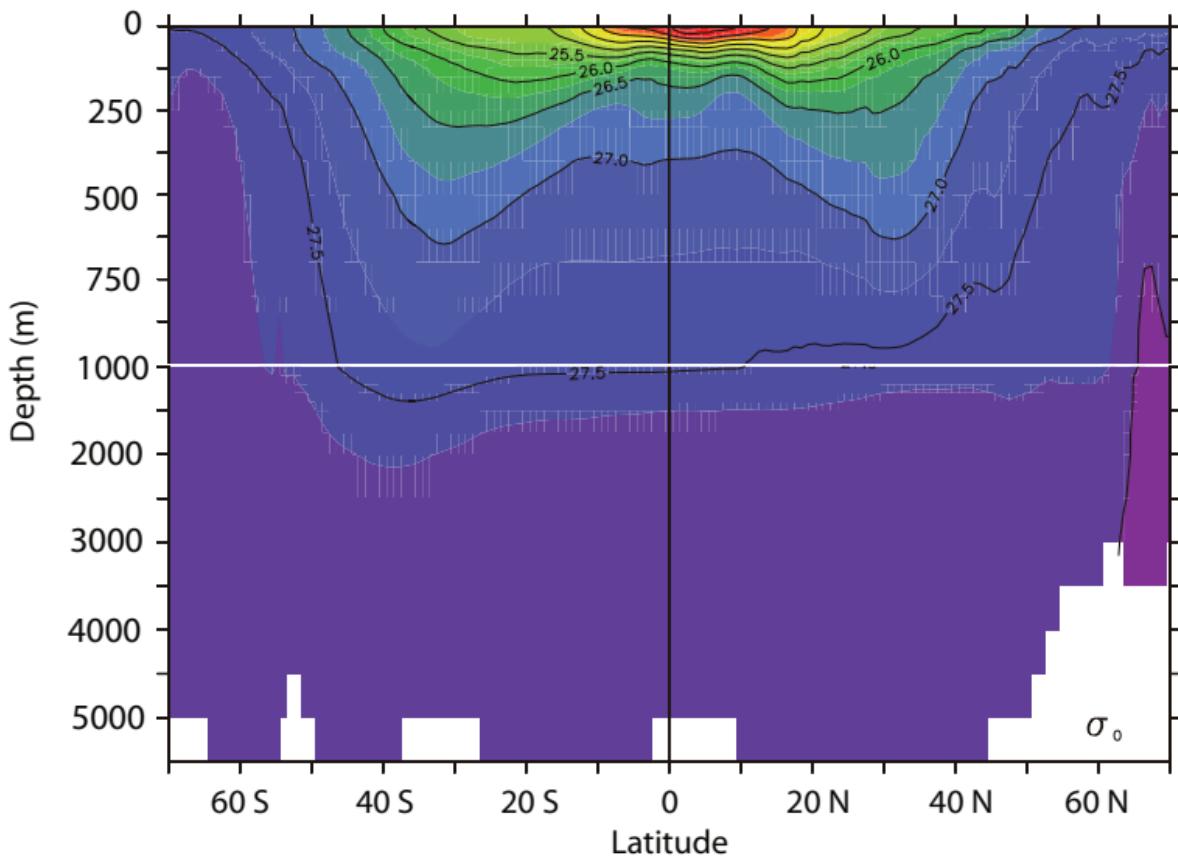


Fig. 21.2

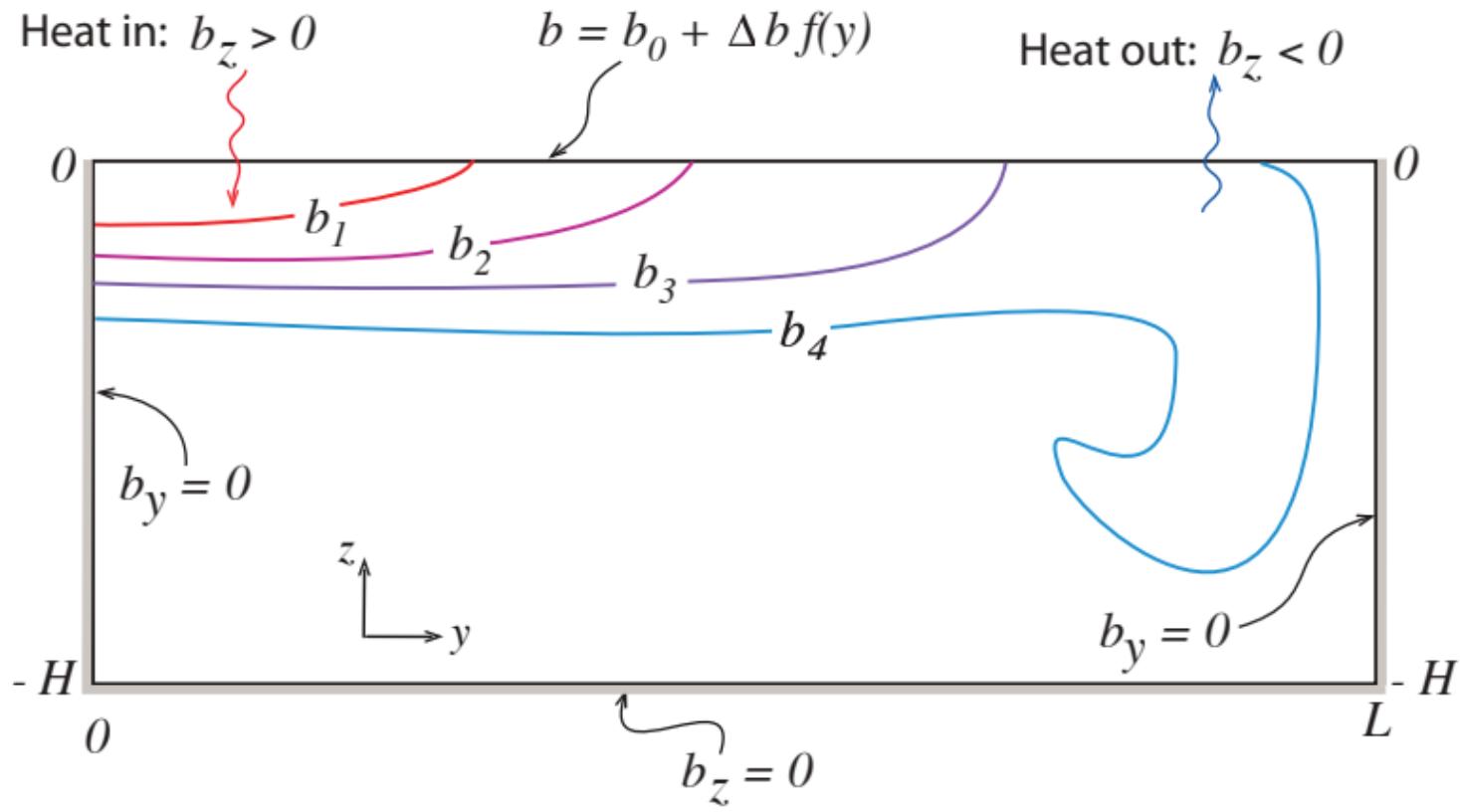
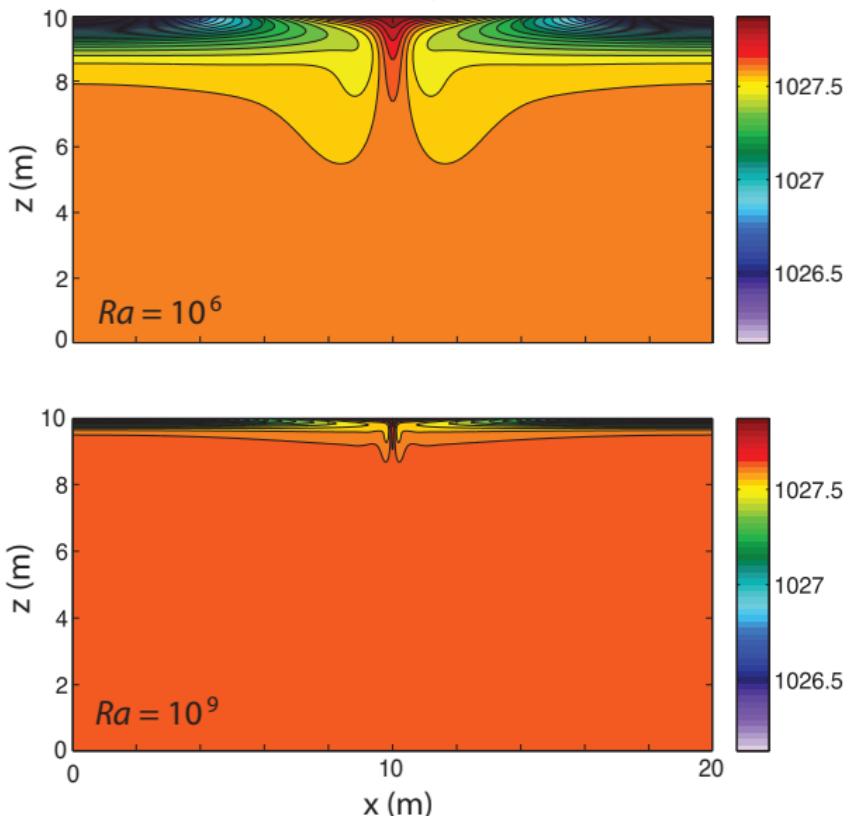


Fig. 21.3

Density



Streamfunction

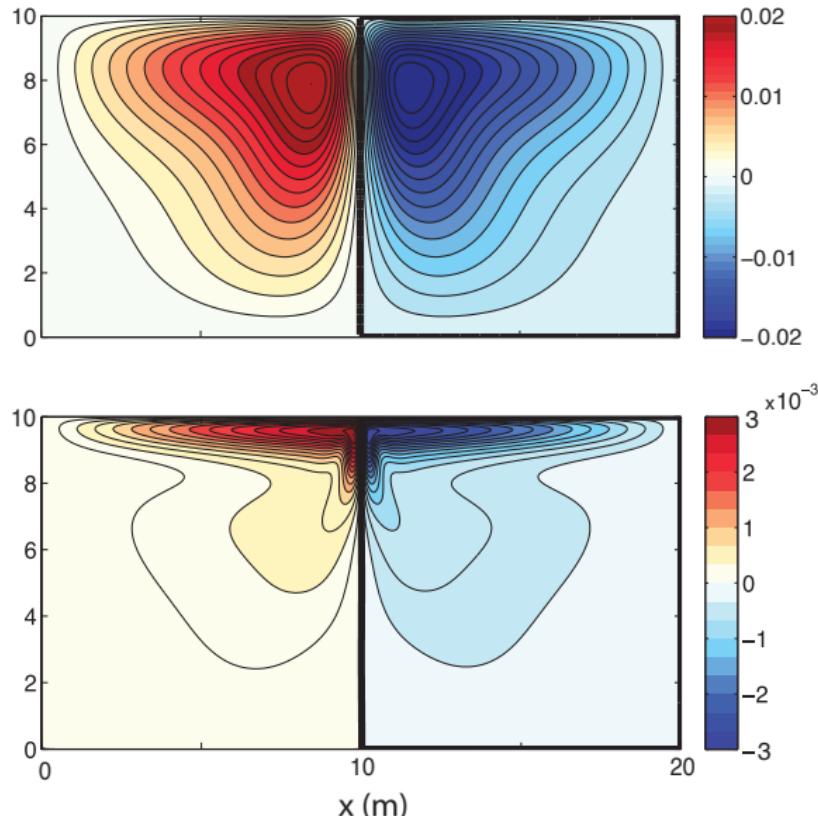
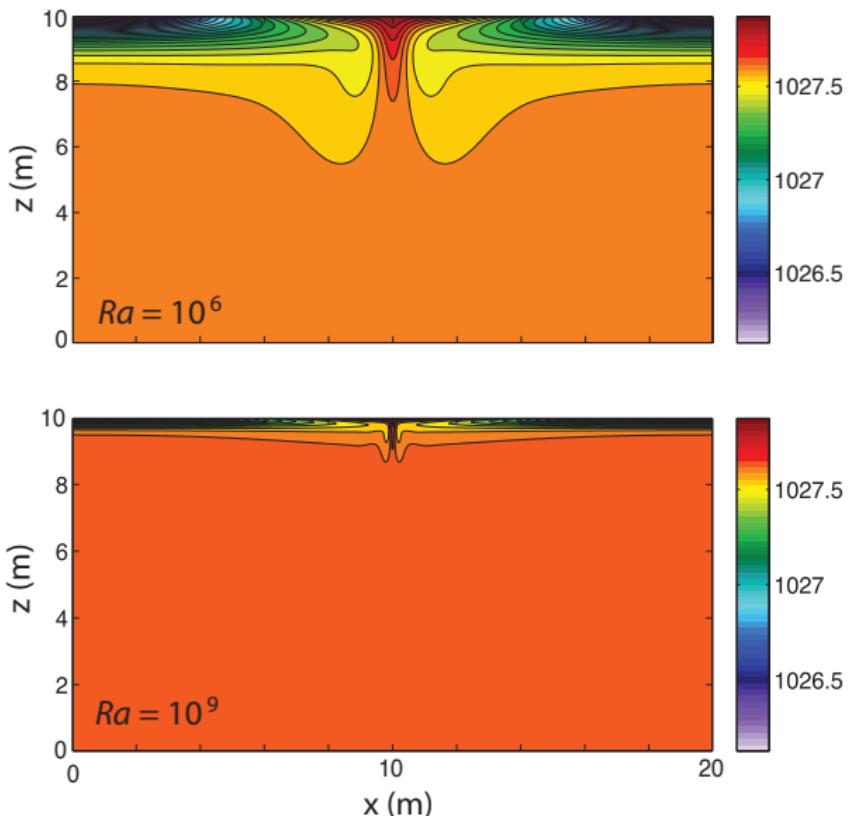
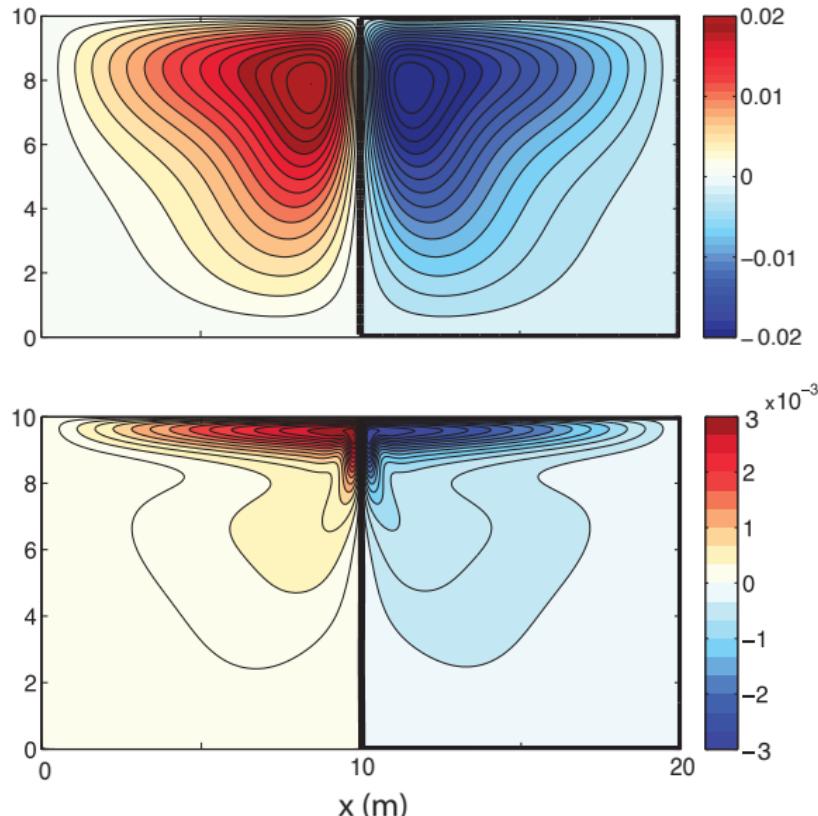


Fig. 21.4

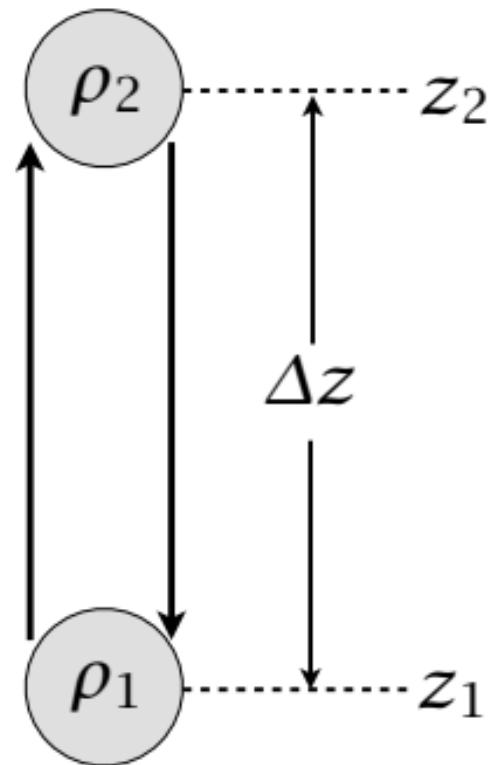


Fig. 21.5

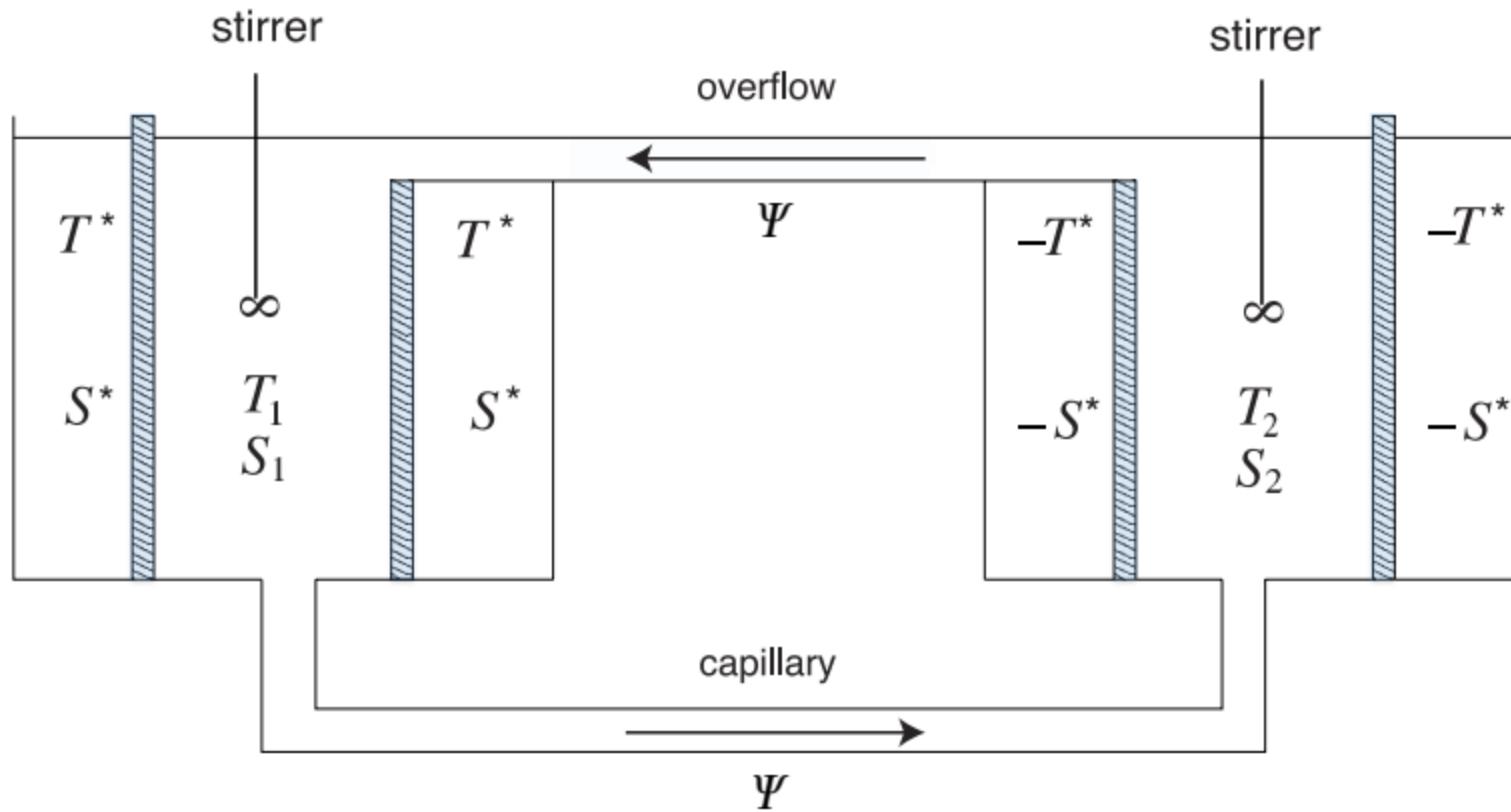


Fig. 21.6

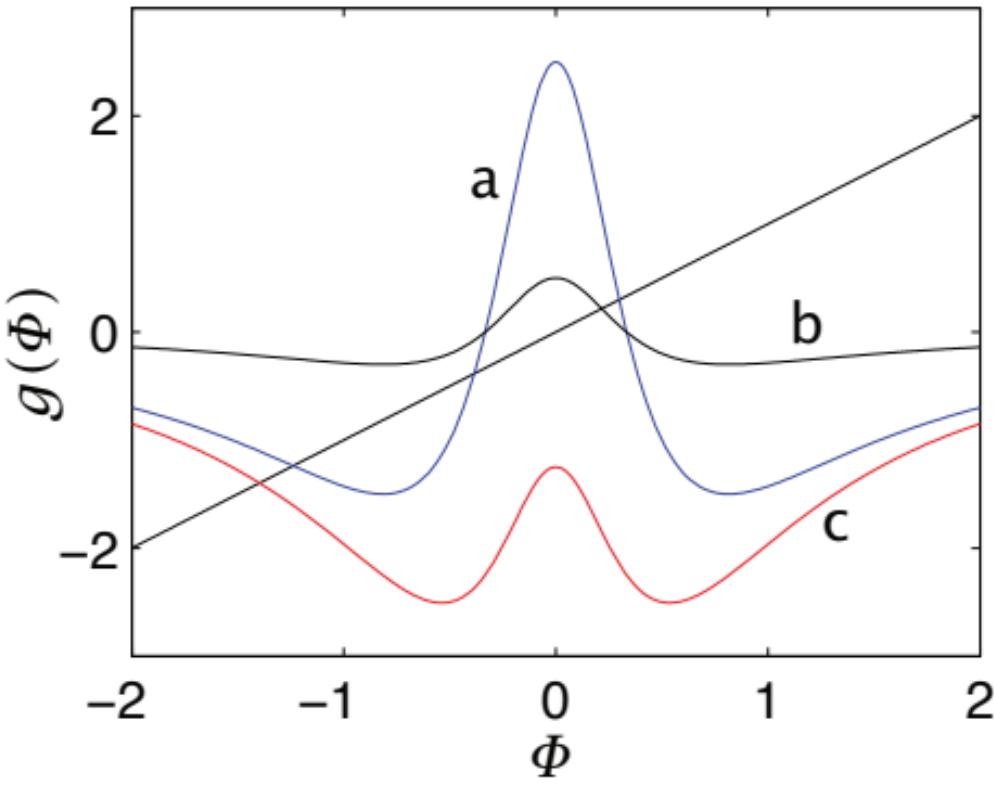
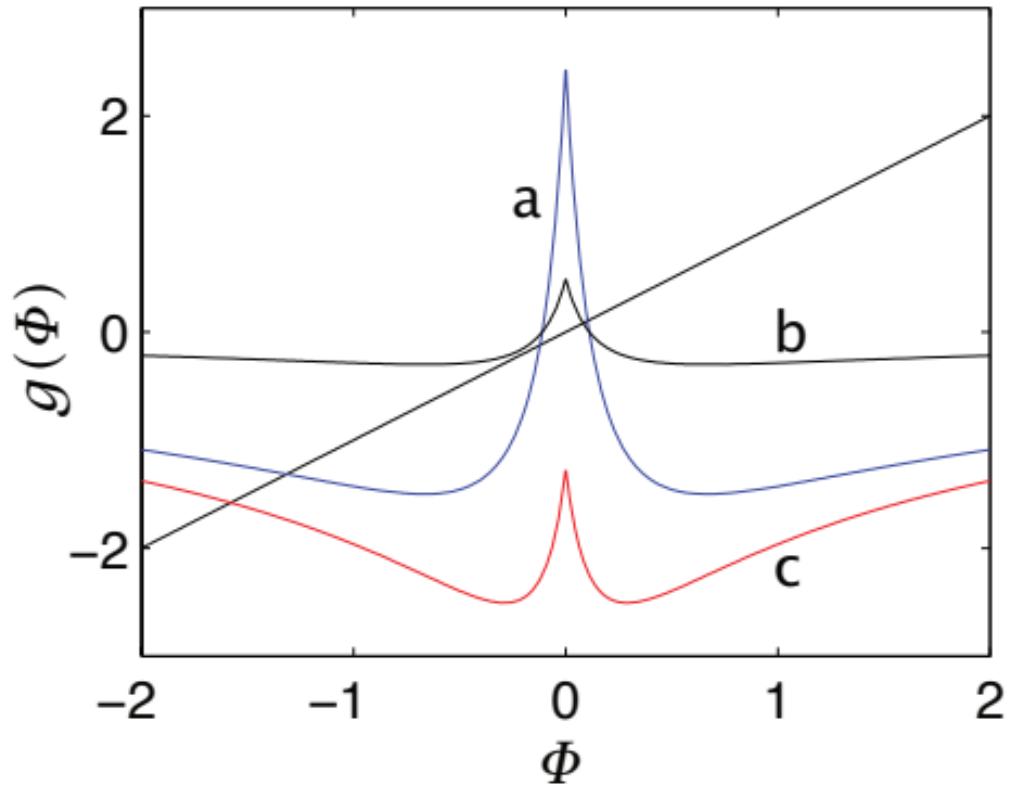


Fig. 21.7

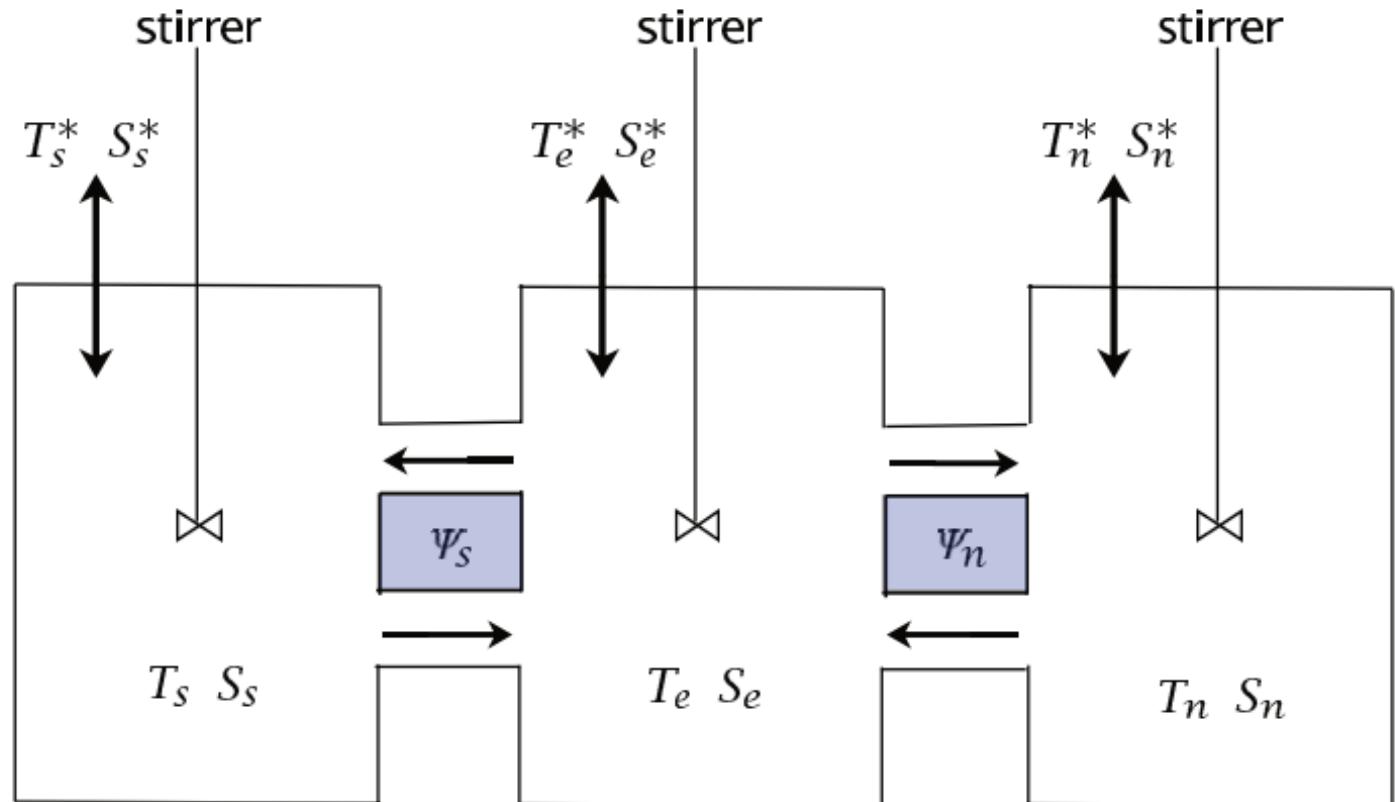


Fig. 21.8

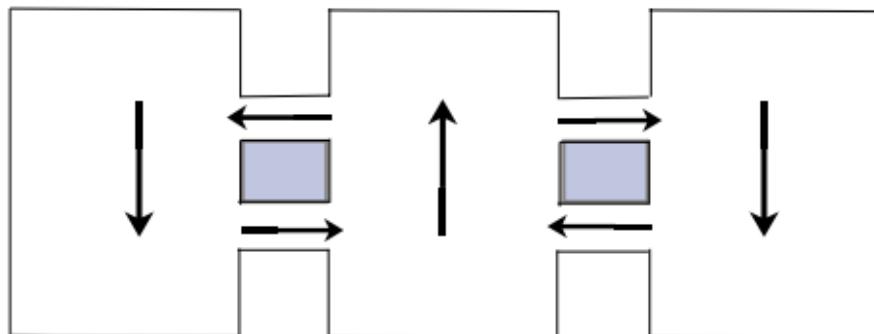
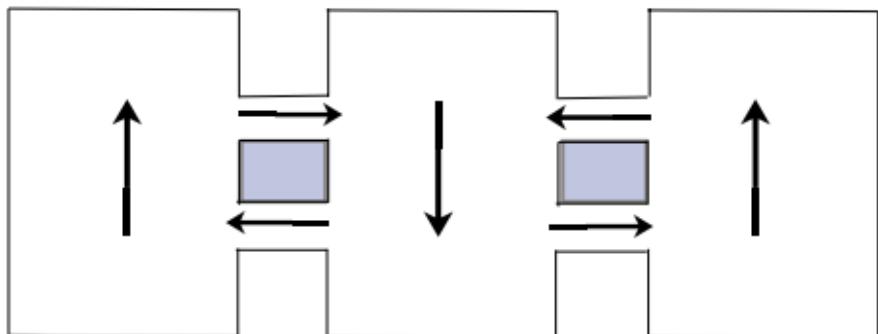
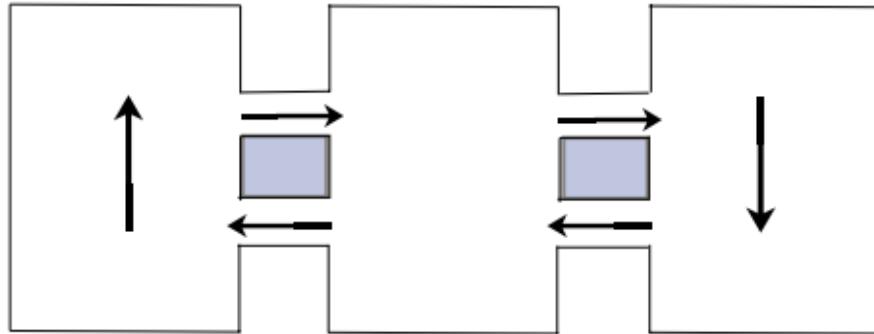
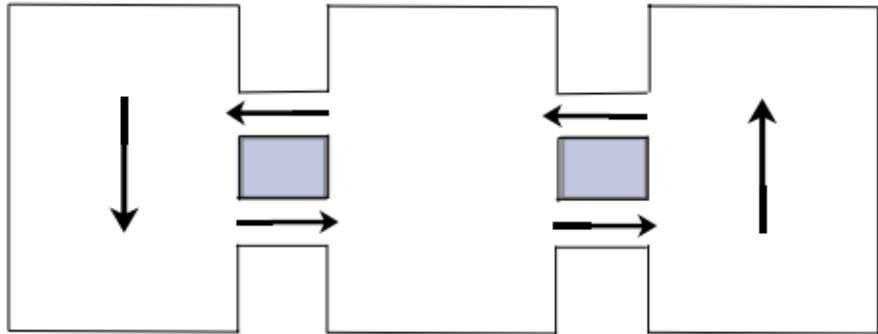


Fig. 21.9

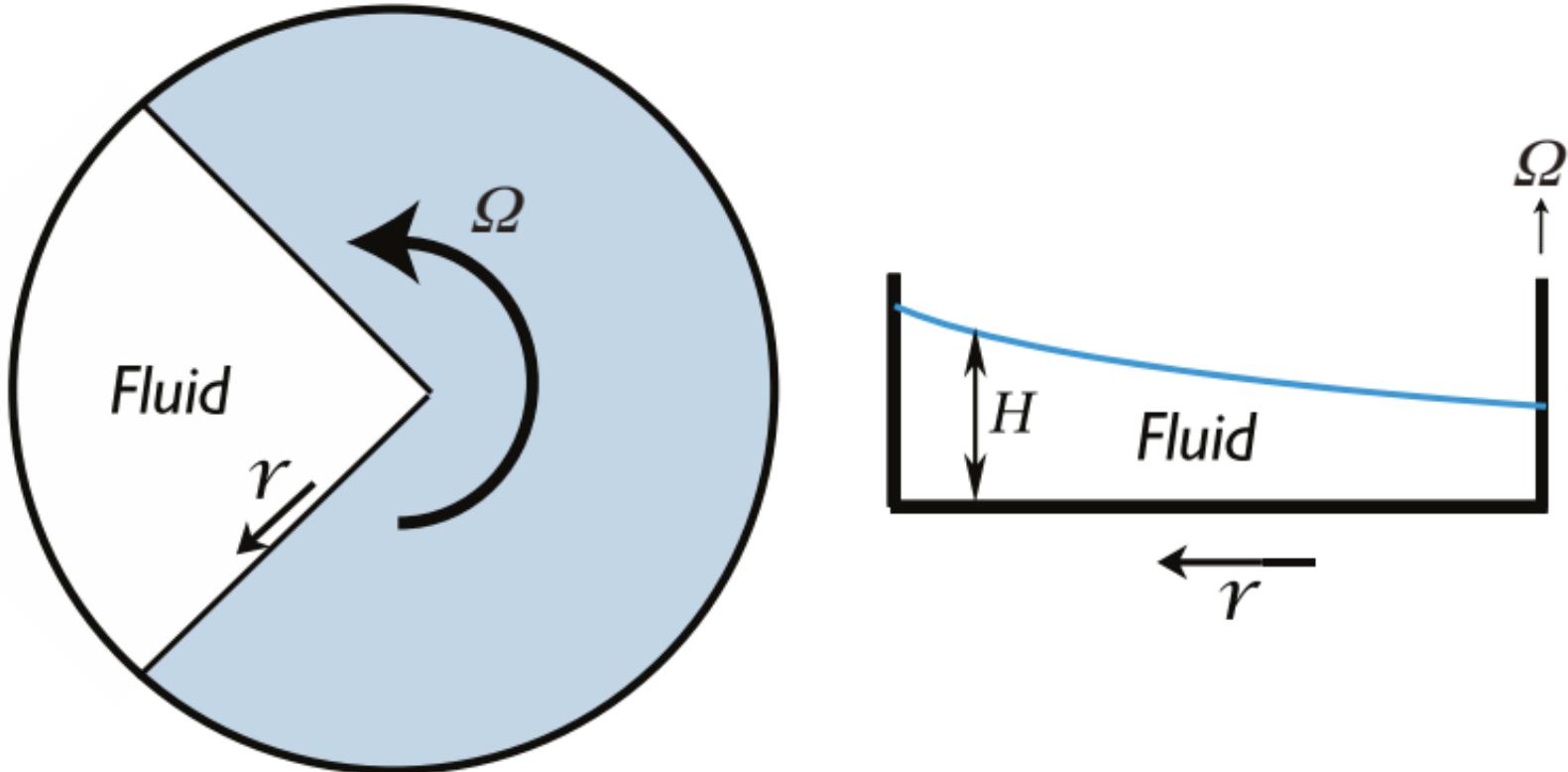


Fig. 21.10

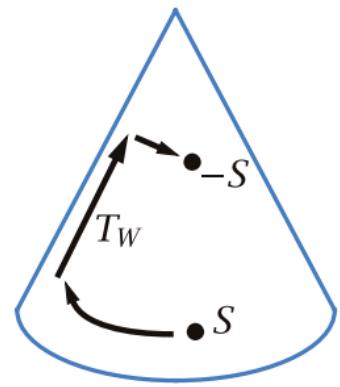
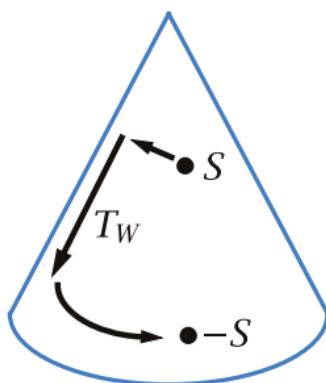
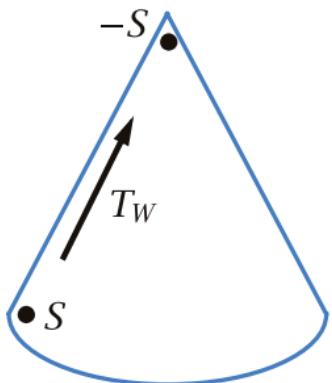
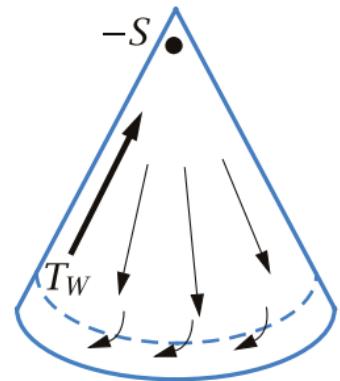
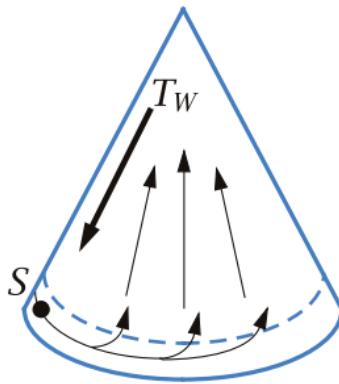
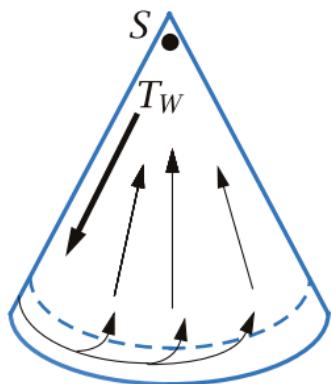


Fig. 21.11

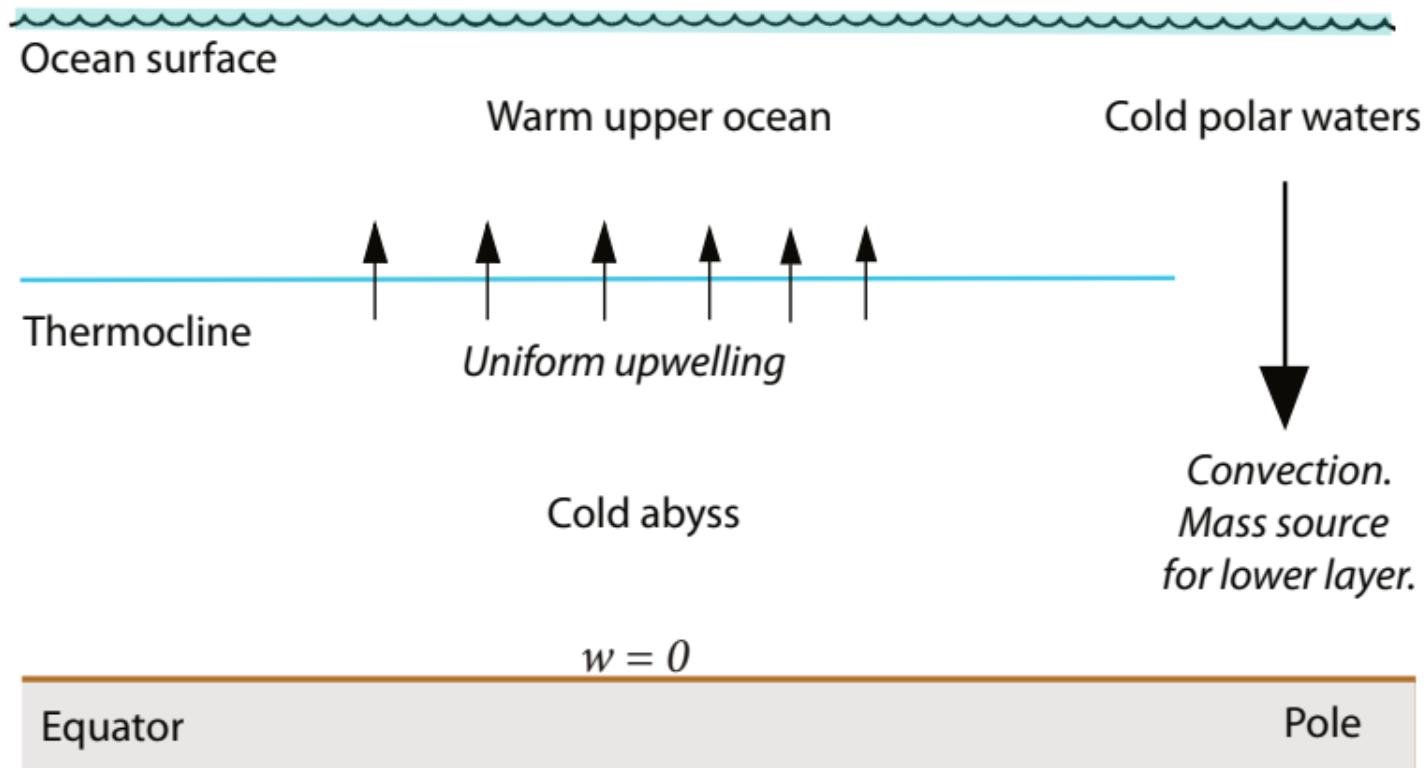


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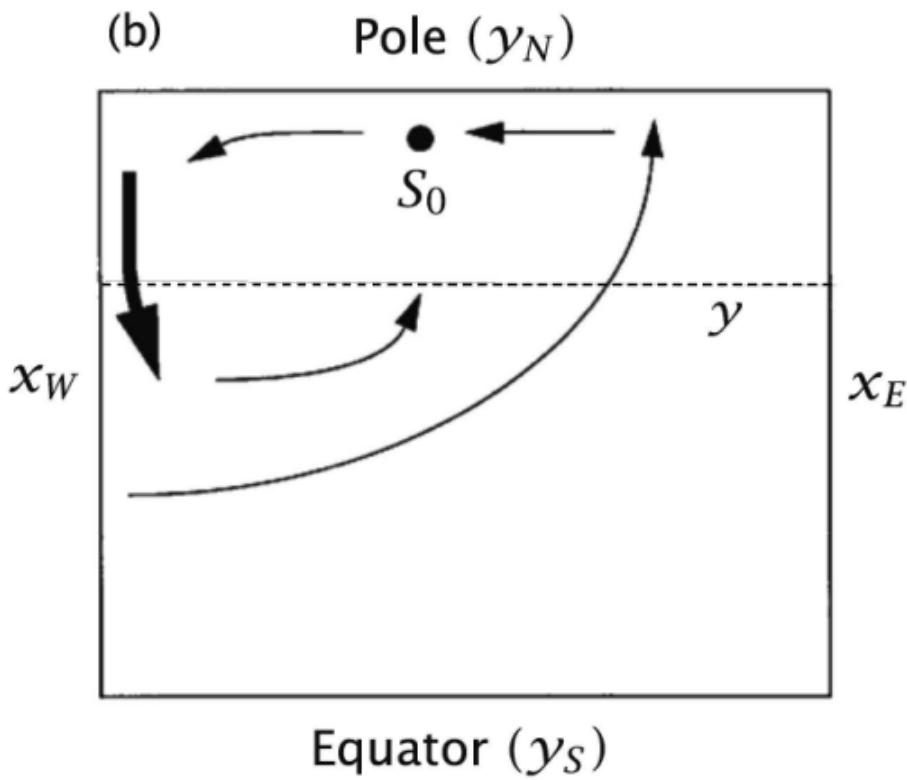
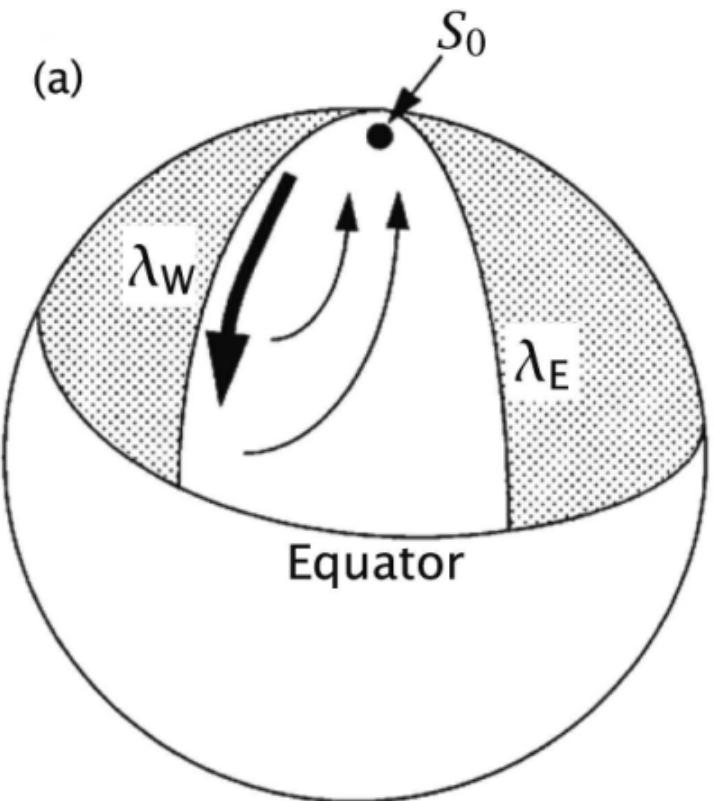


Fig. 21.13

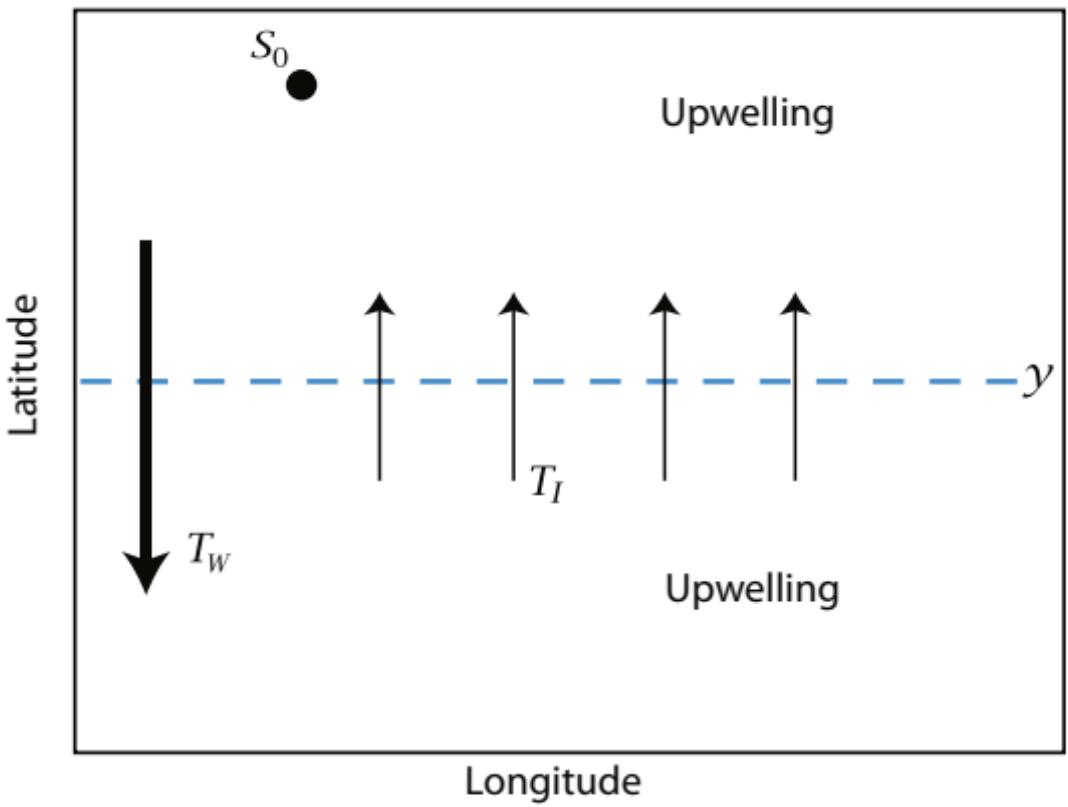


Fig. 21.14

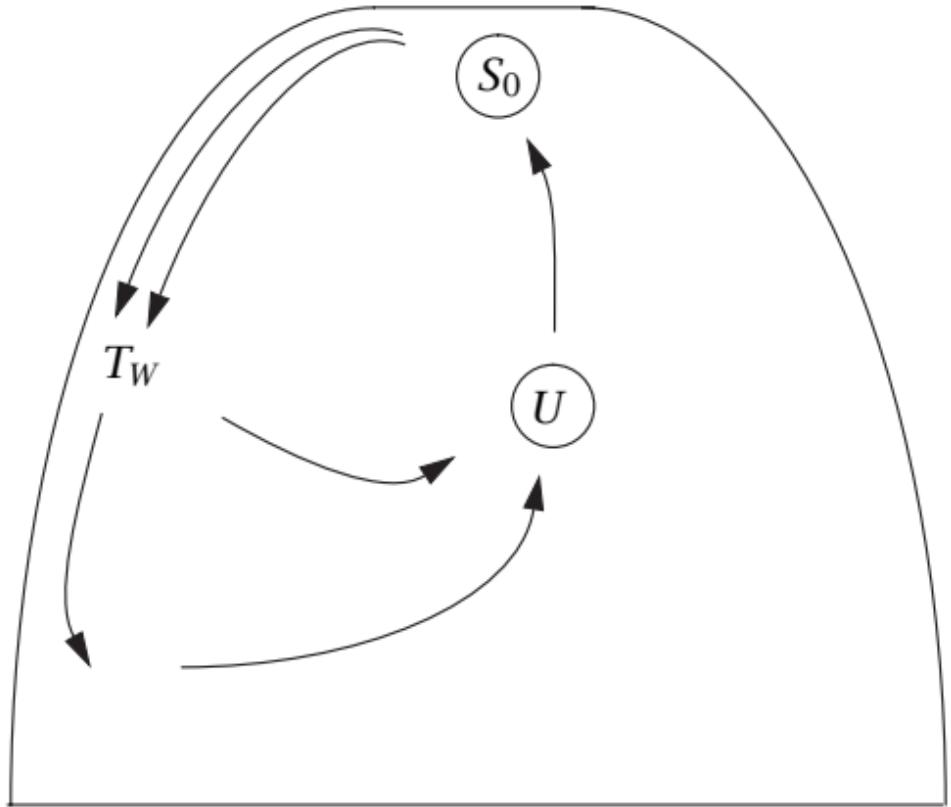


Fig. 21.15

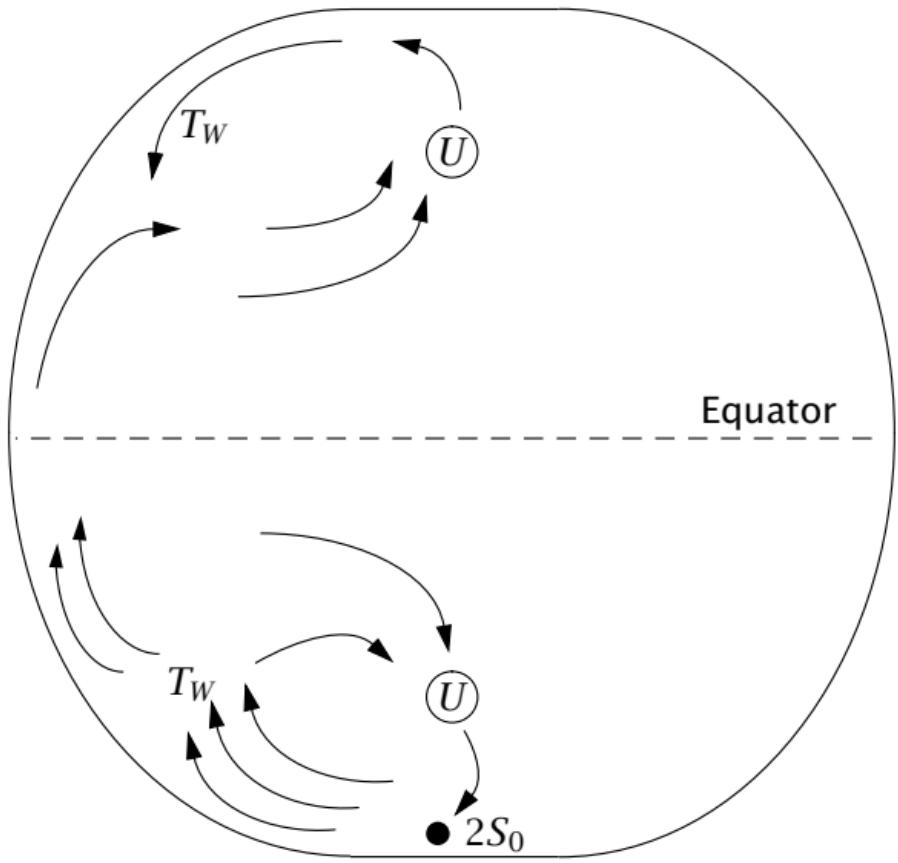


Fig. 21.16

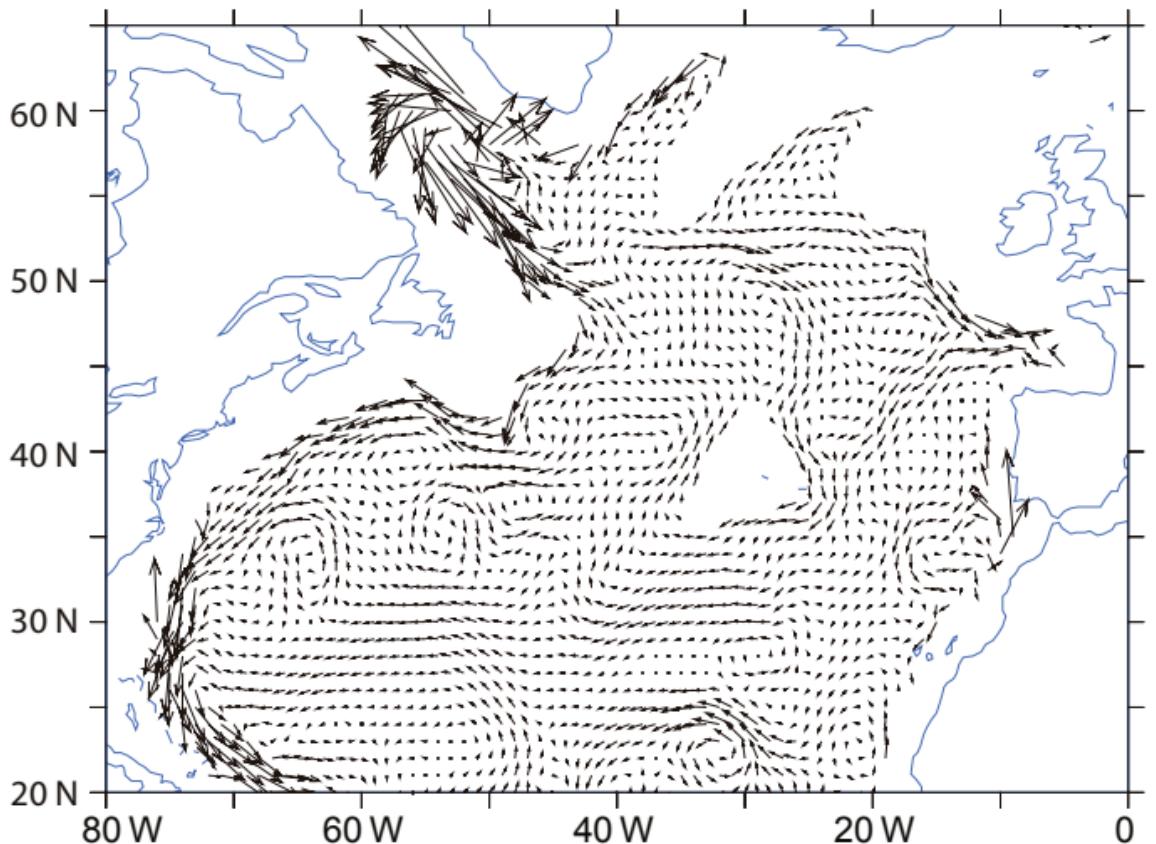


Fig. 21.17

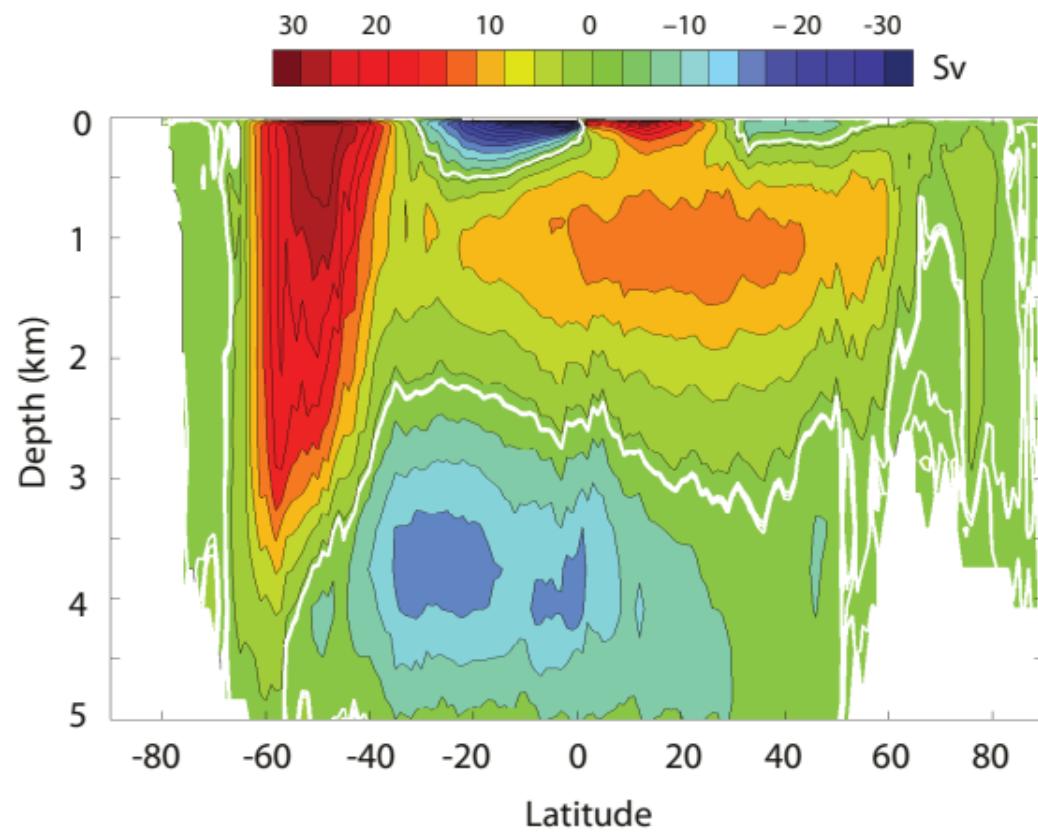
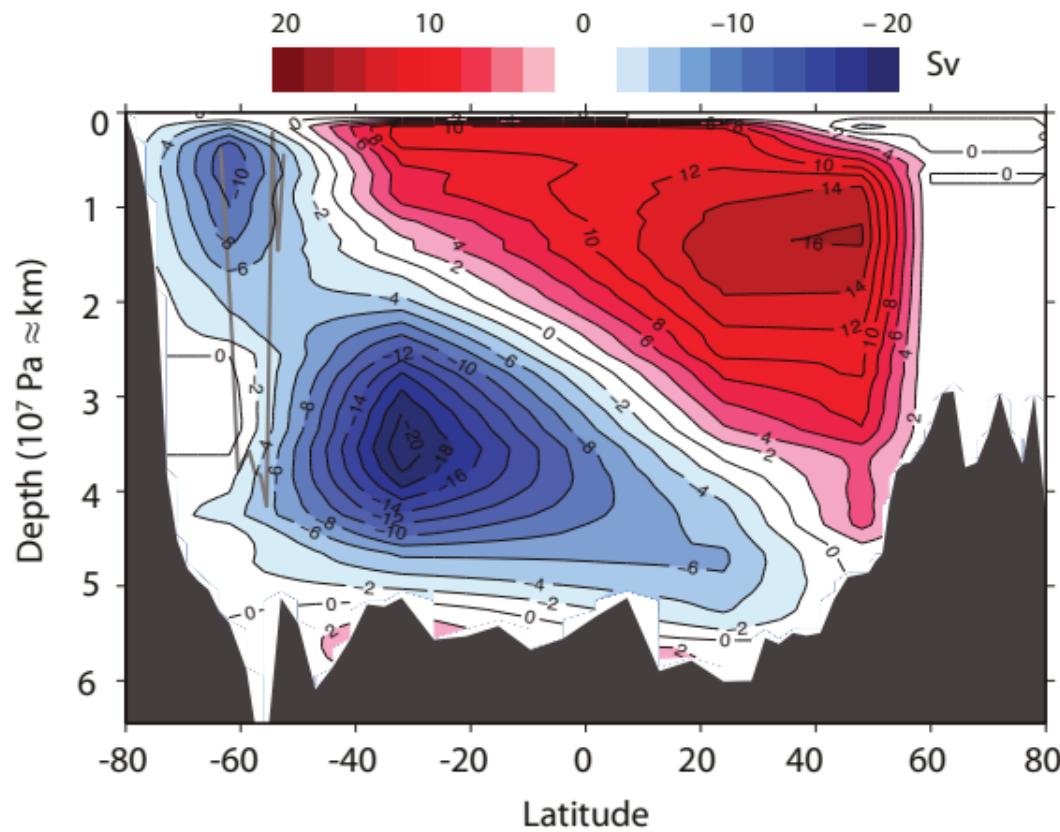


Fig. 21.18

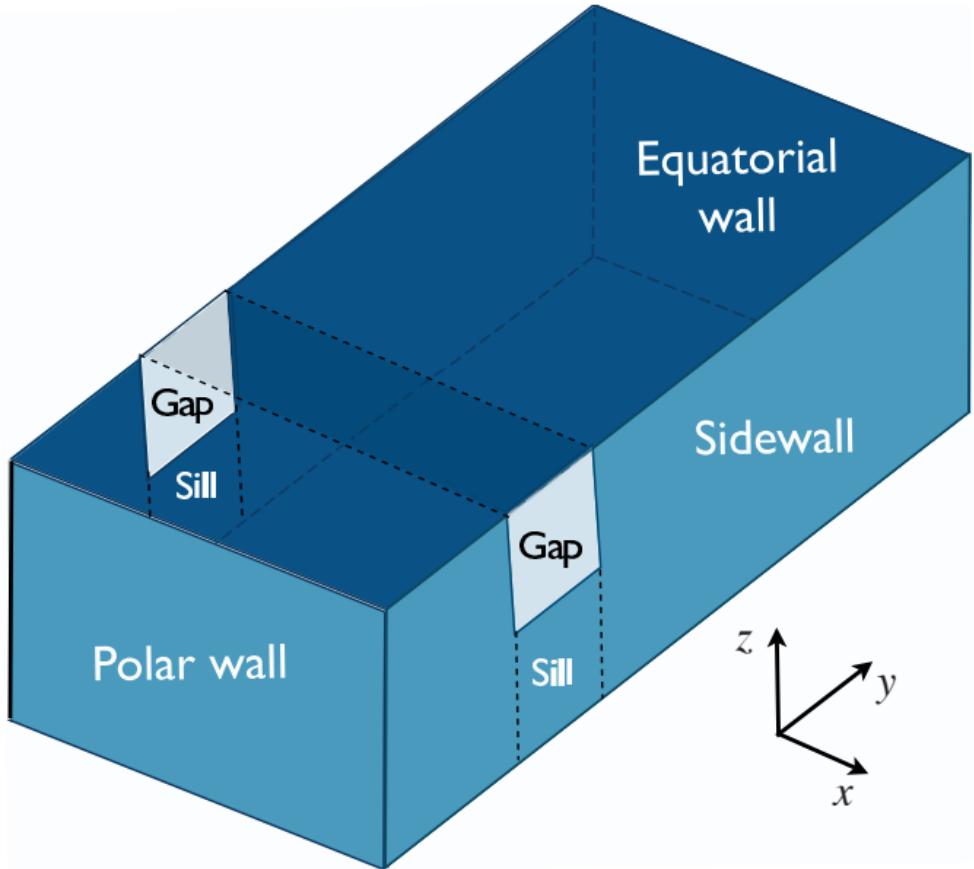


Fig. 21.19

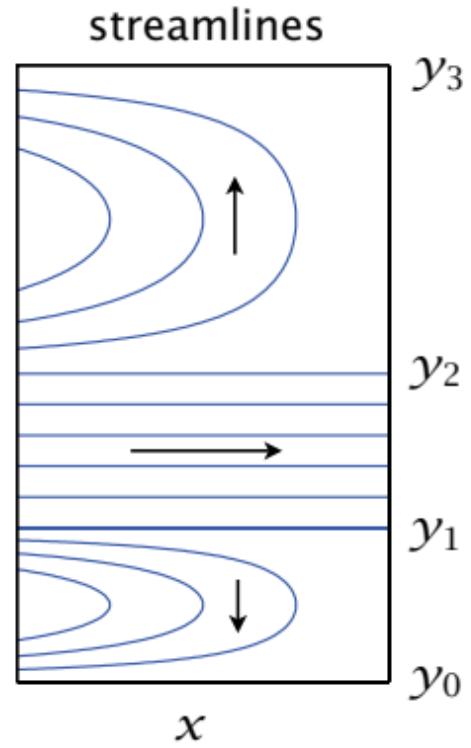
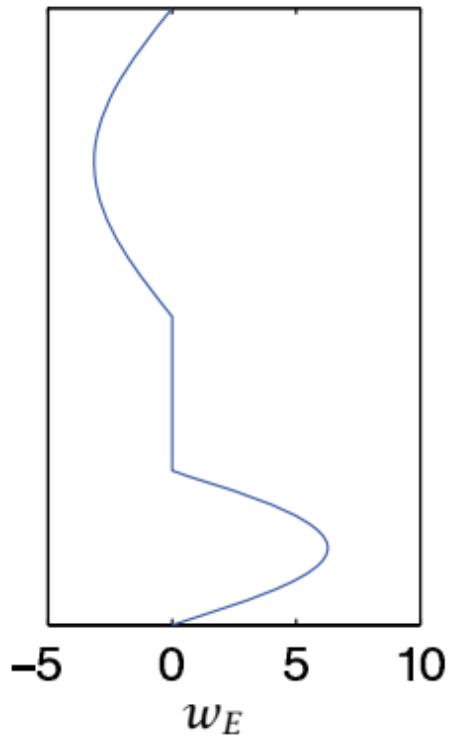
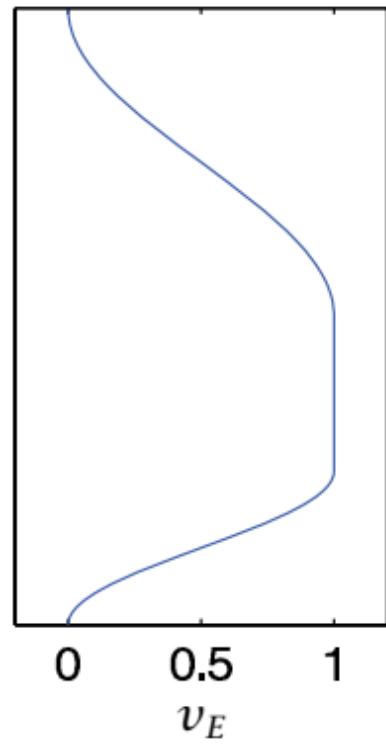
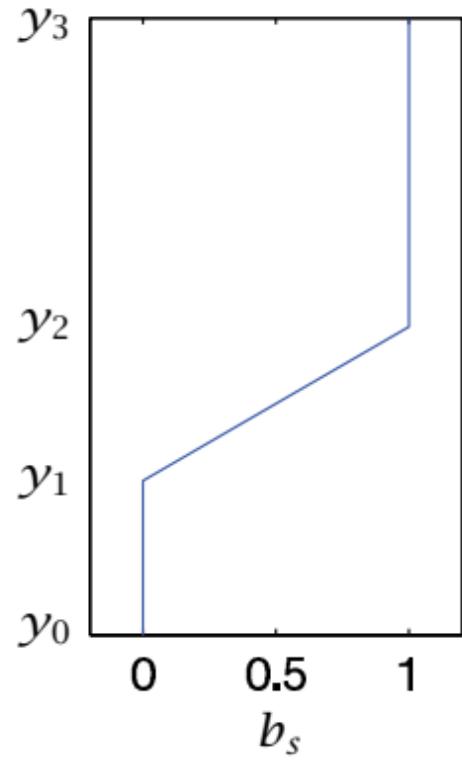


Fig. 21.20

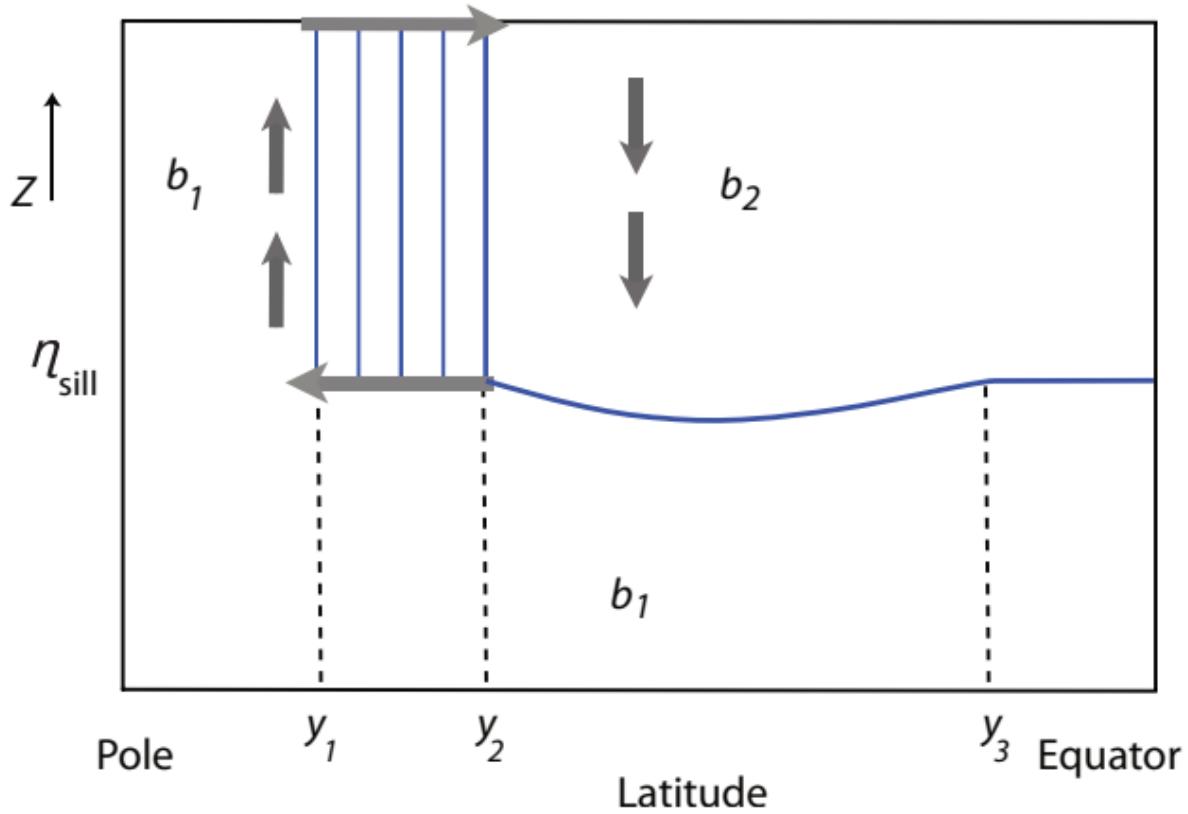


Fig. 21.21

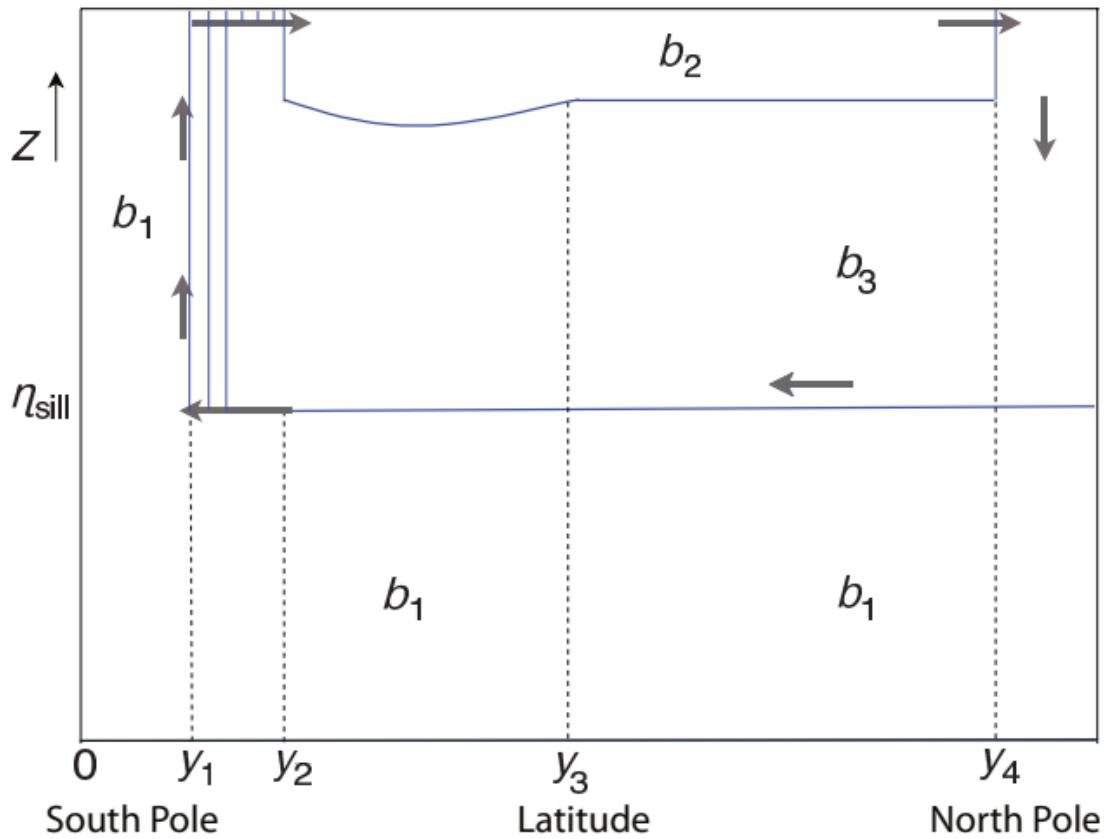


Fig. 21.22

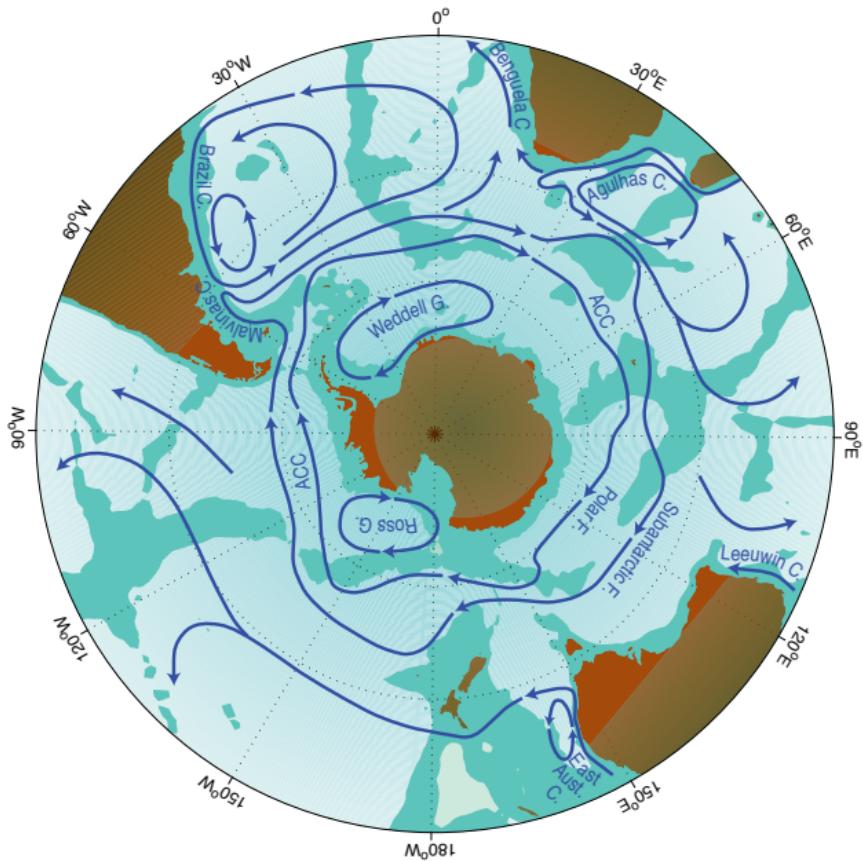


Fig. 21.23

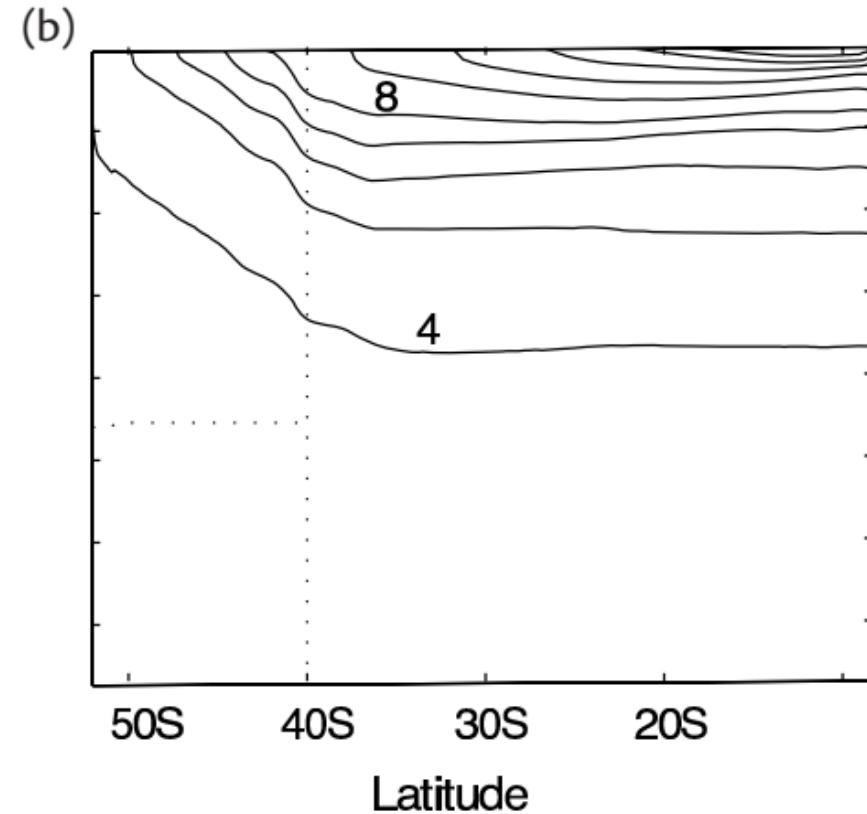
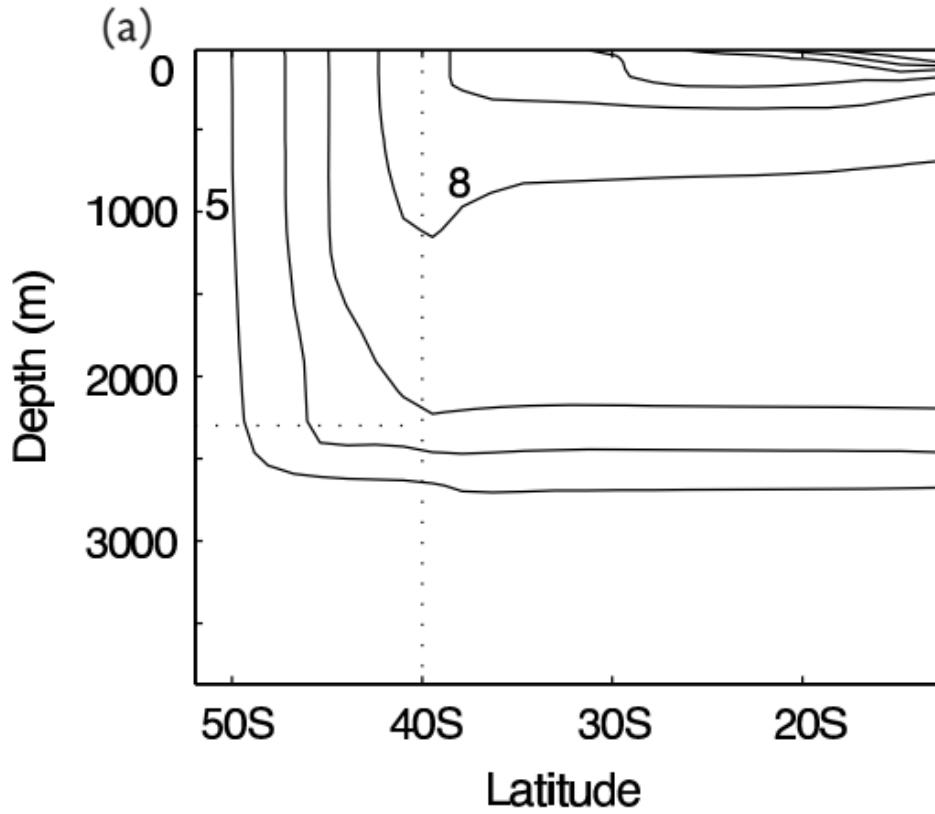
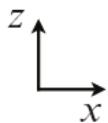
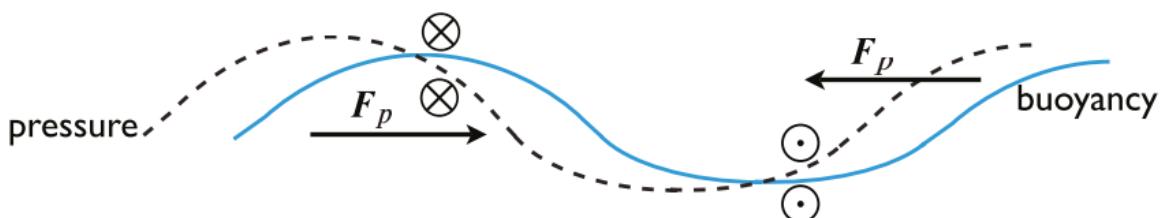
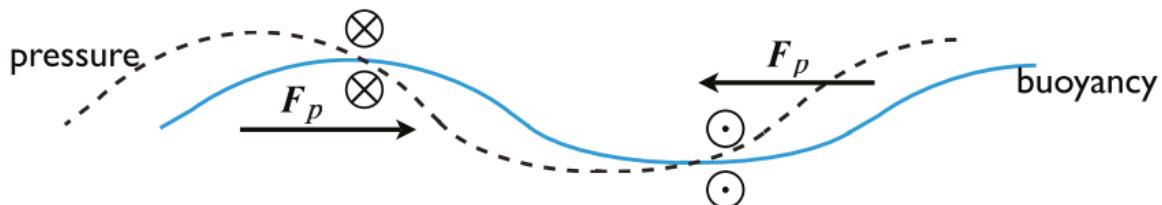
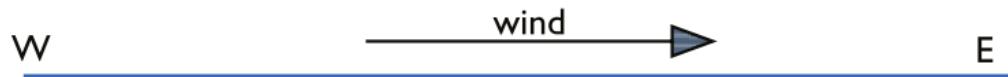


Fig. 21.24



$$\eta' > 0$$

$$b' < 0$$

$$v' > 0$$

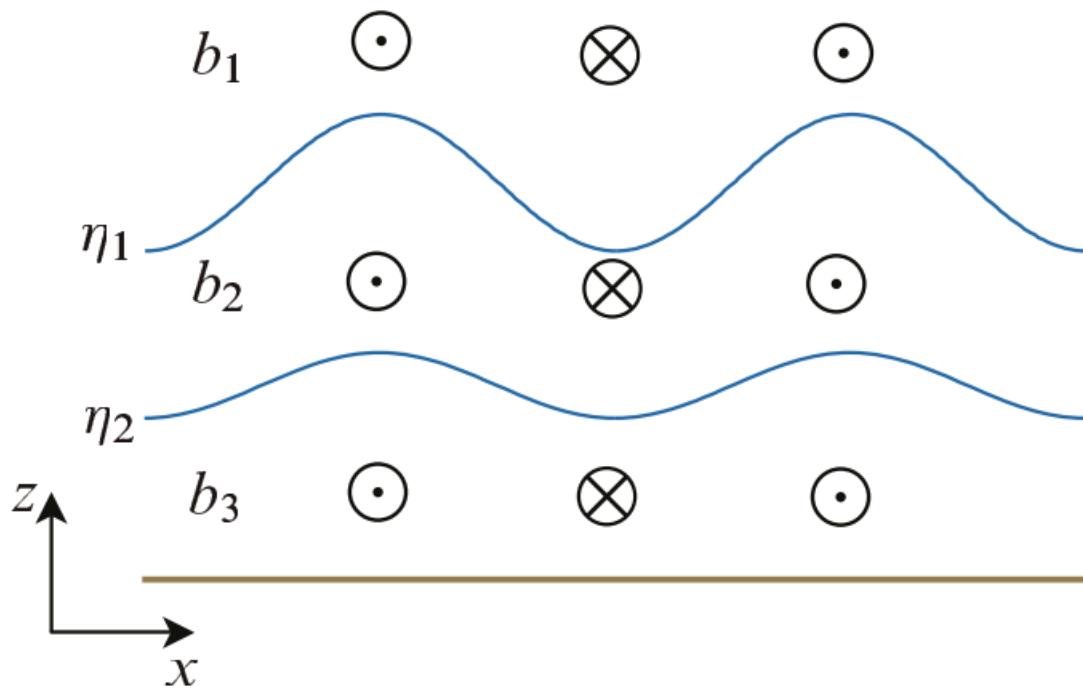
$$\eta' < 0$$

$$b' > 0$$

$$v' < 0$$

Fig. 21.25

Snapshot of eddying flow



Residual, or
thickness-weighted
averaged flow

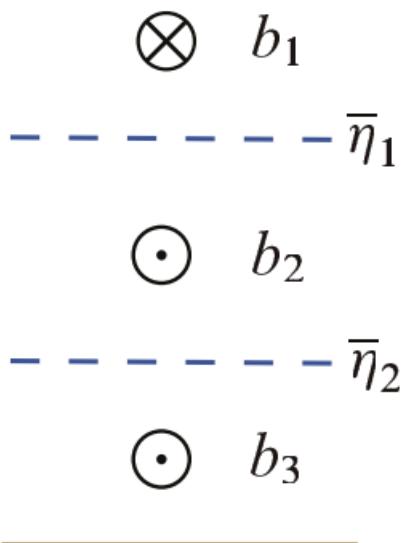


Fig. 21.26

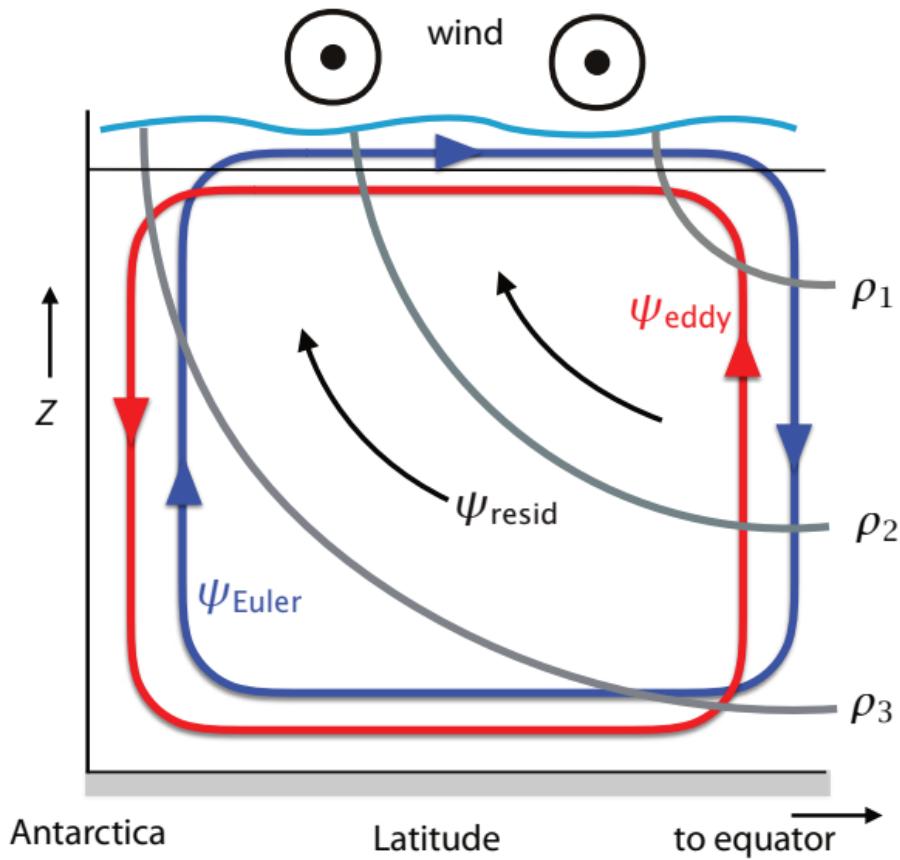


Fig. 21.27

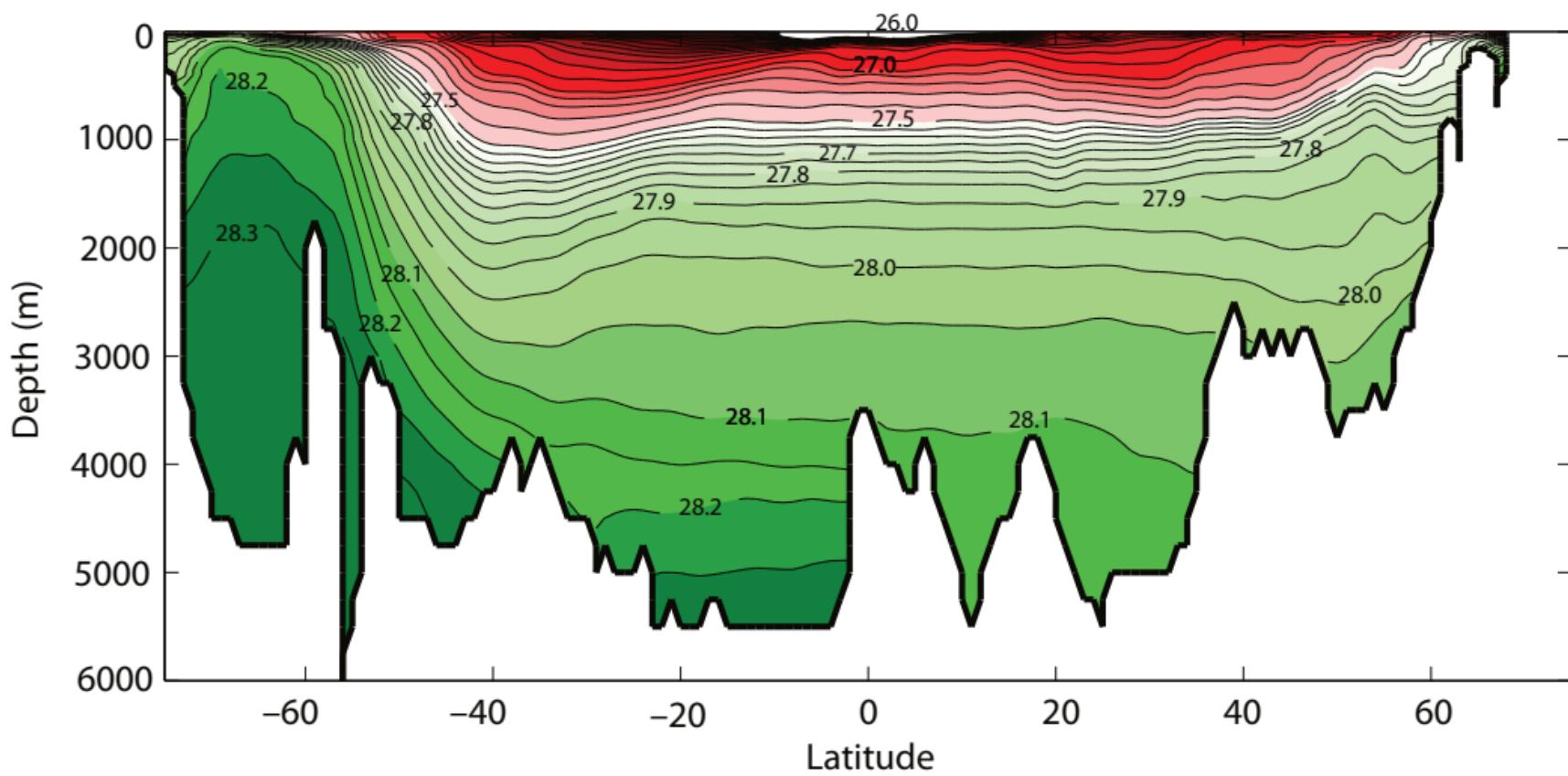


Fig. 21.28

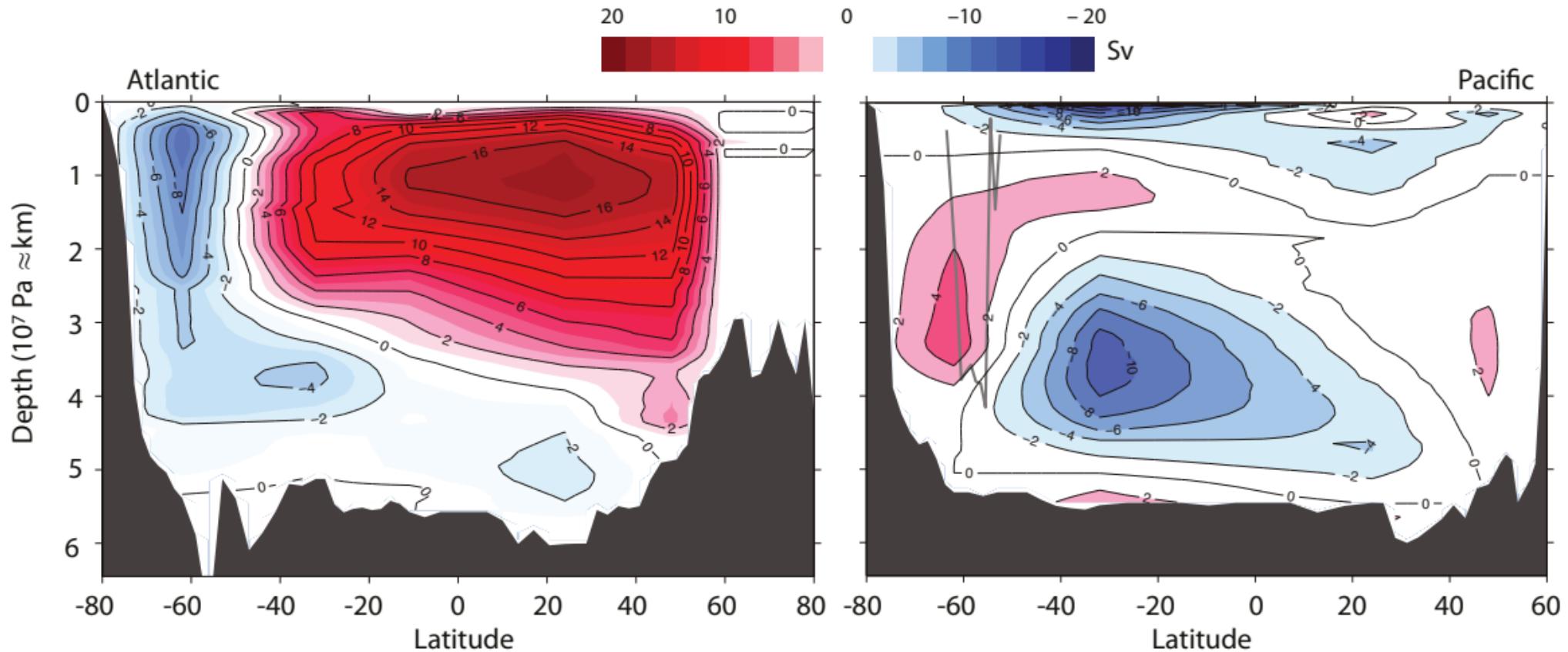


Fig. 21.29

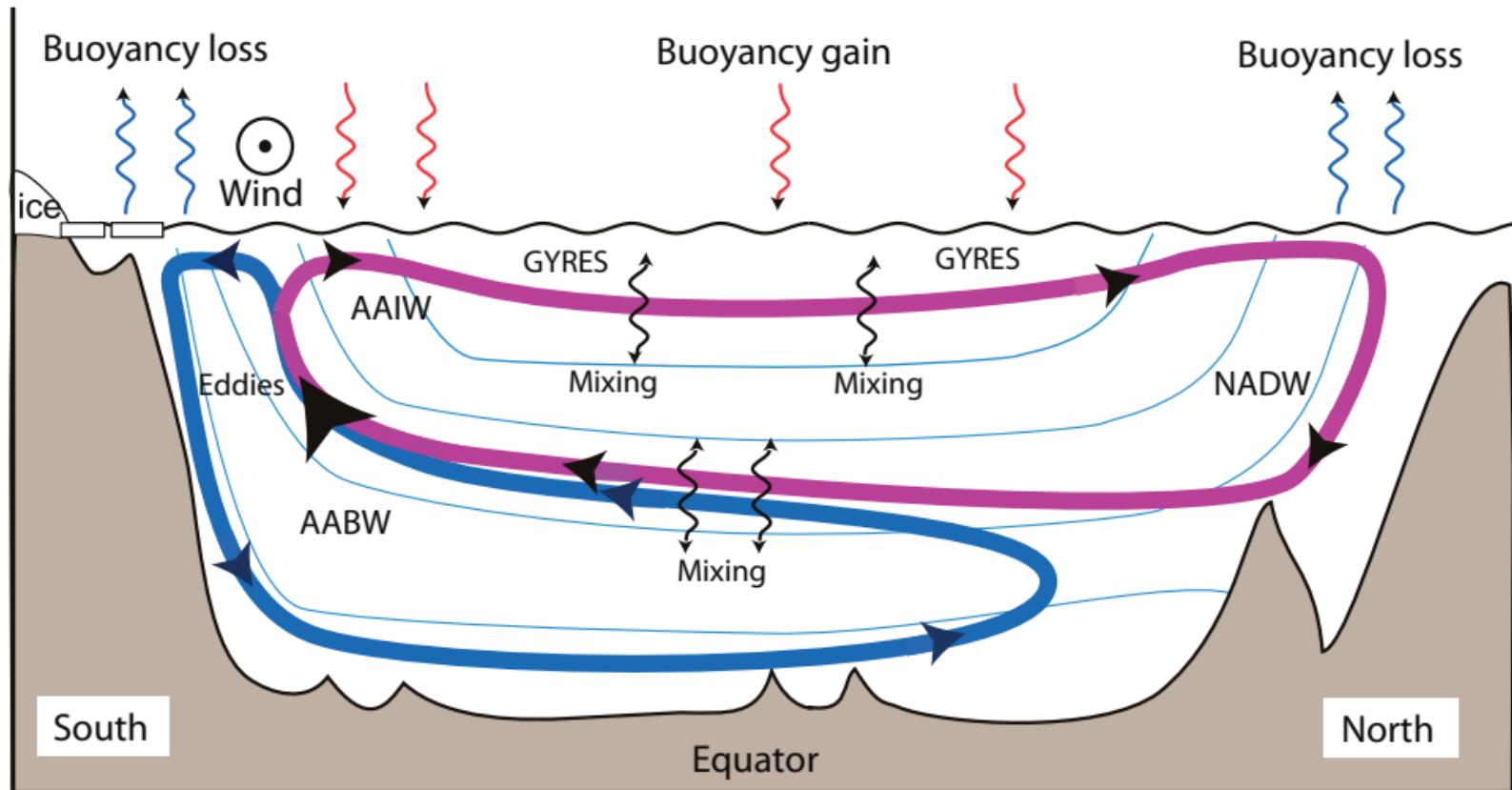


Fig. 21.30

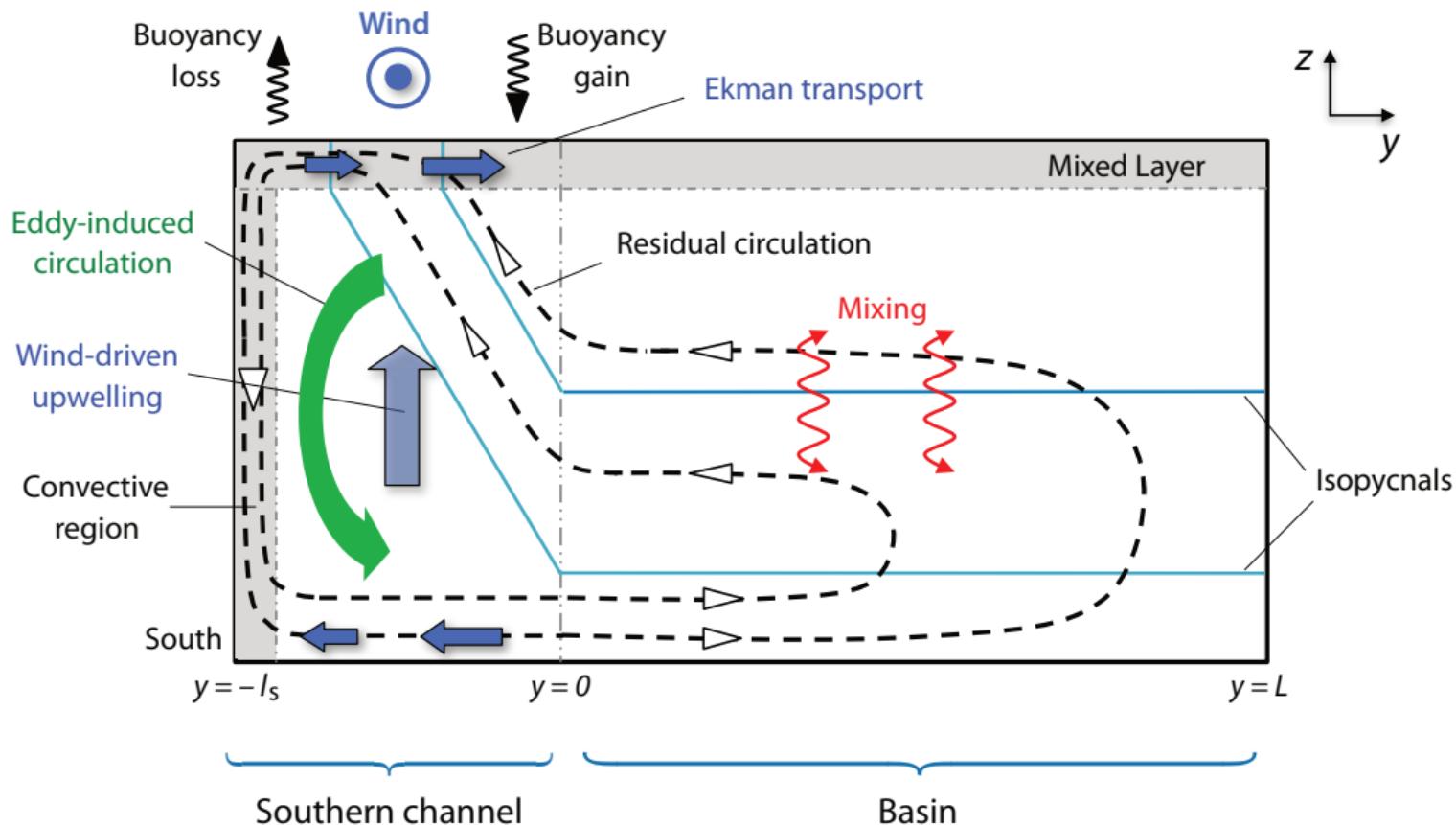


Fig. 21.31

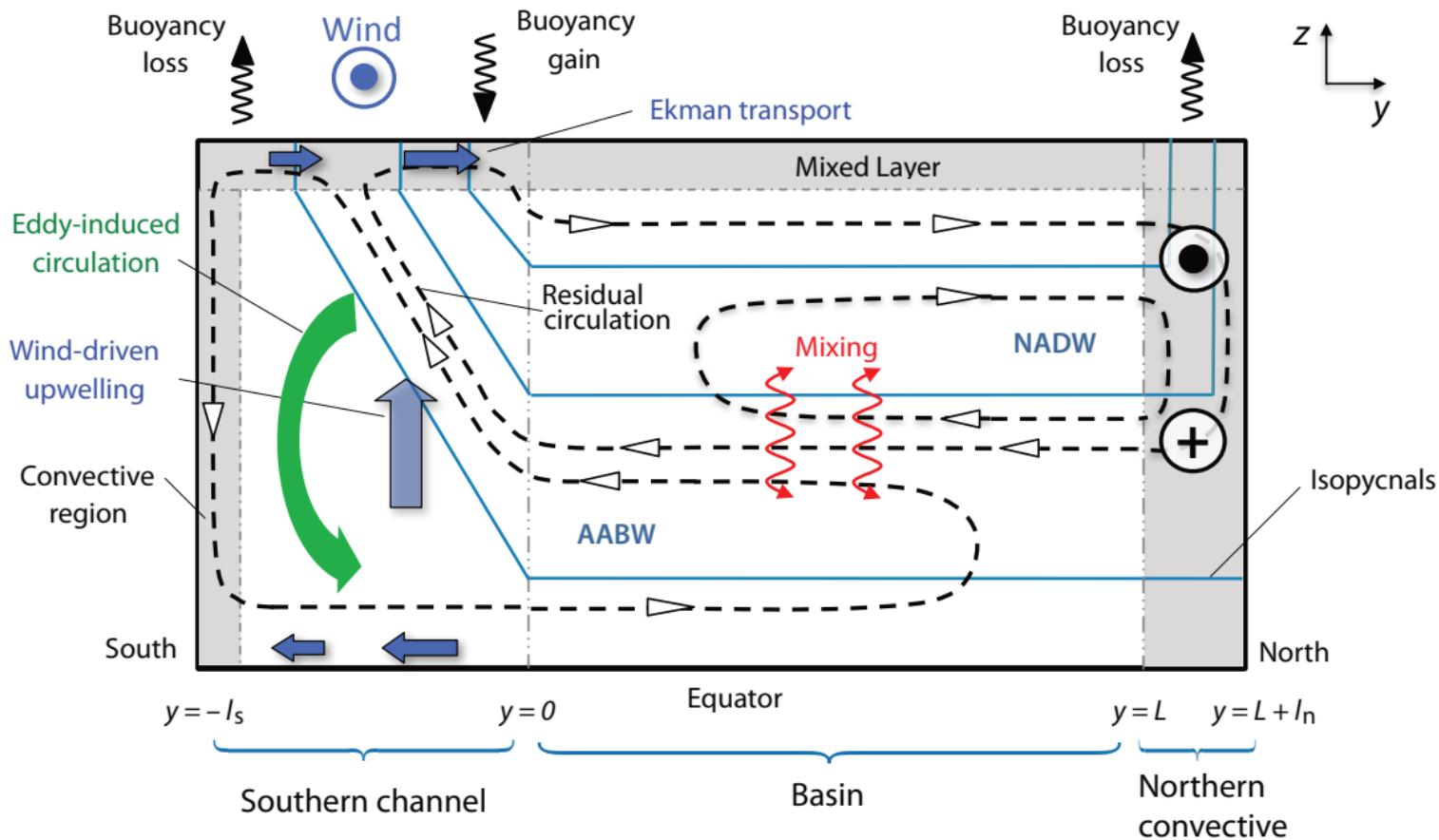


Fig. 21.32

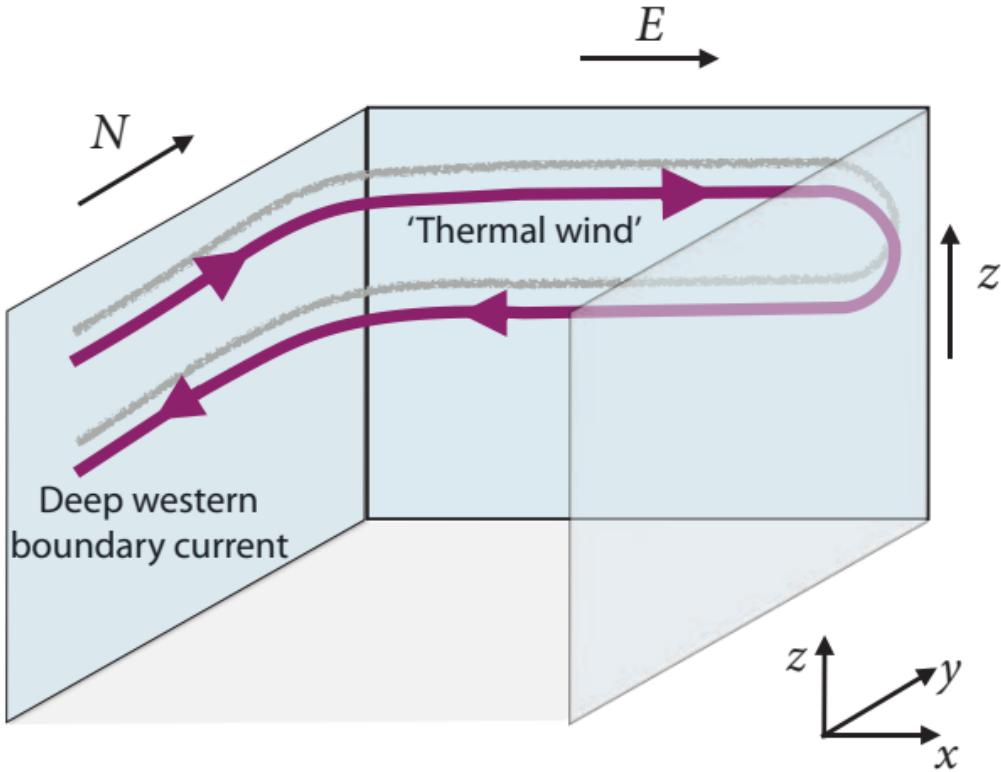


Fig. 21.33

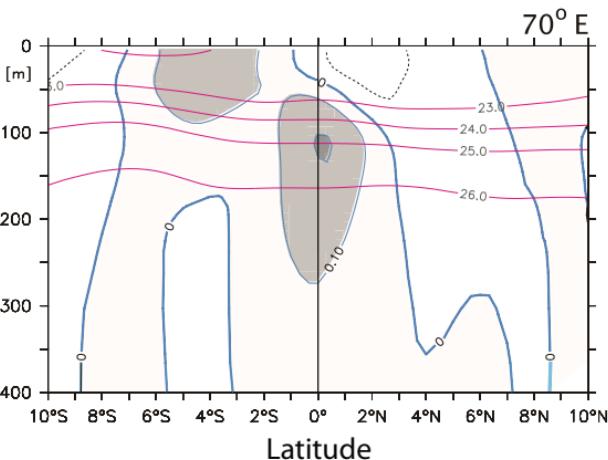
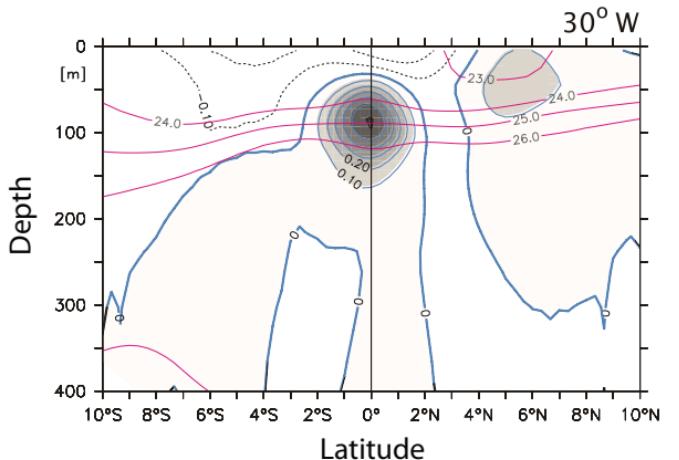
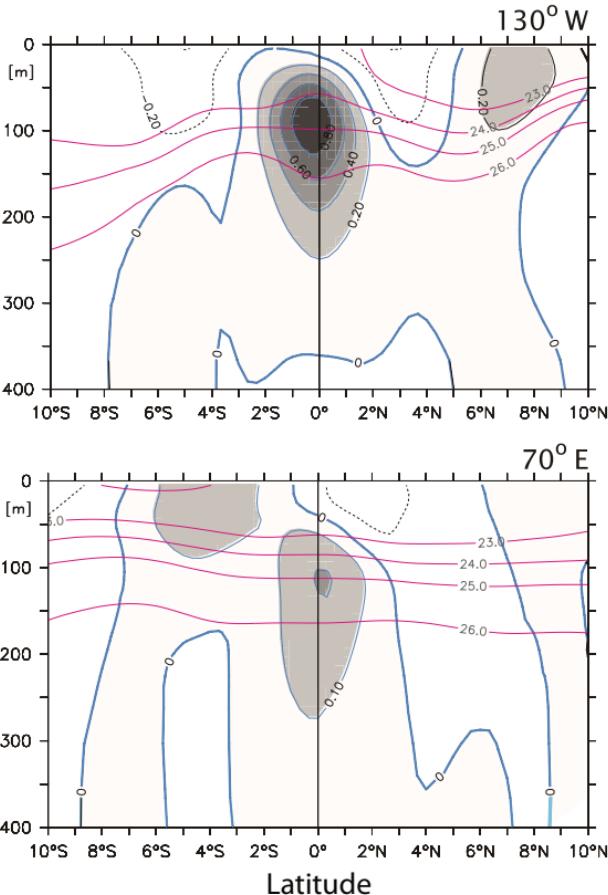
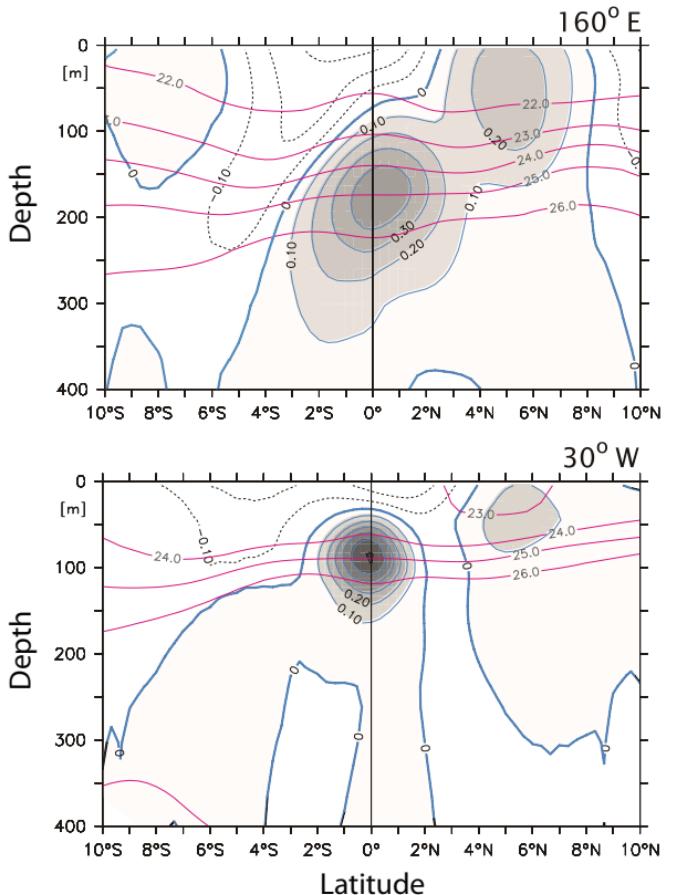


Fig. 22.1

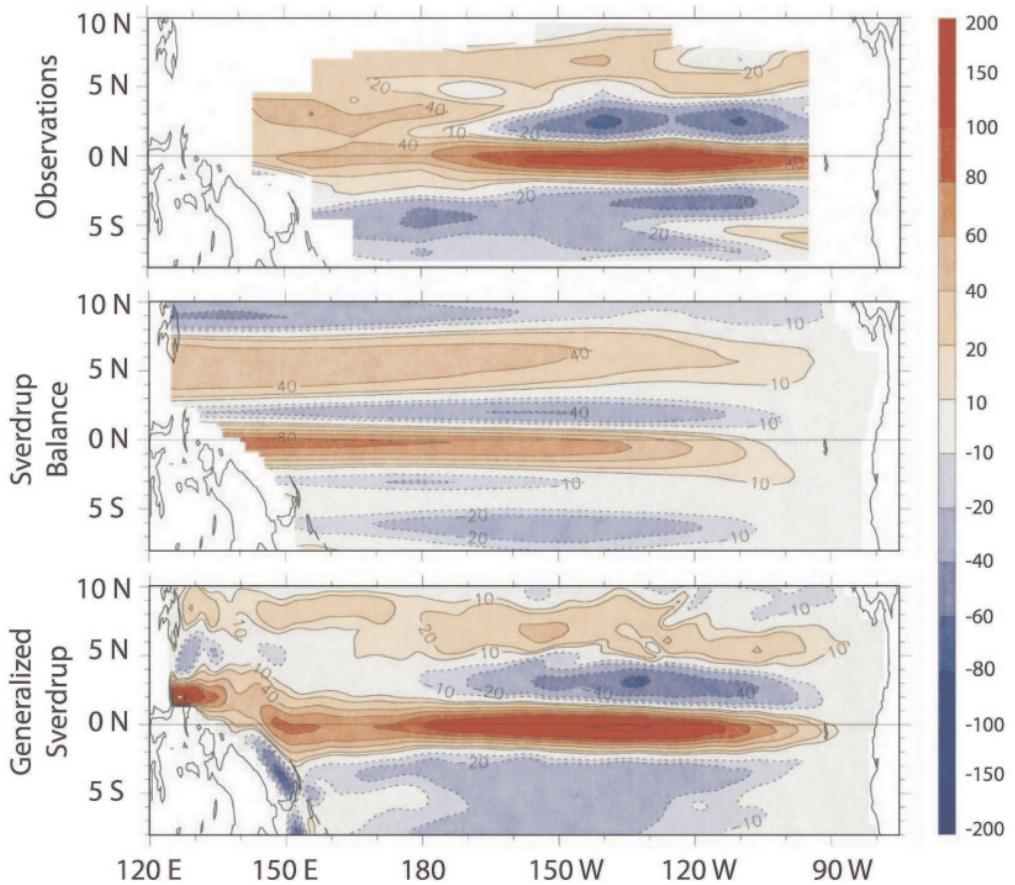


Fig. 22.2

Zonal wind

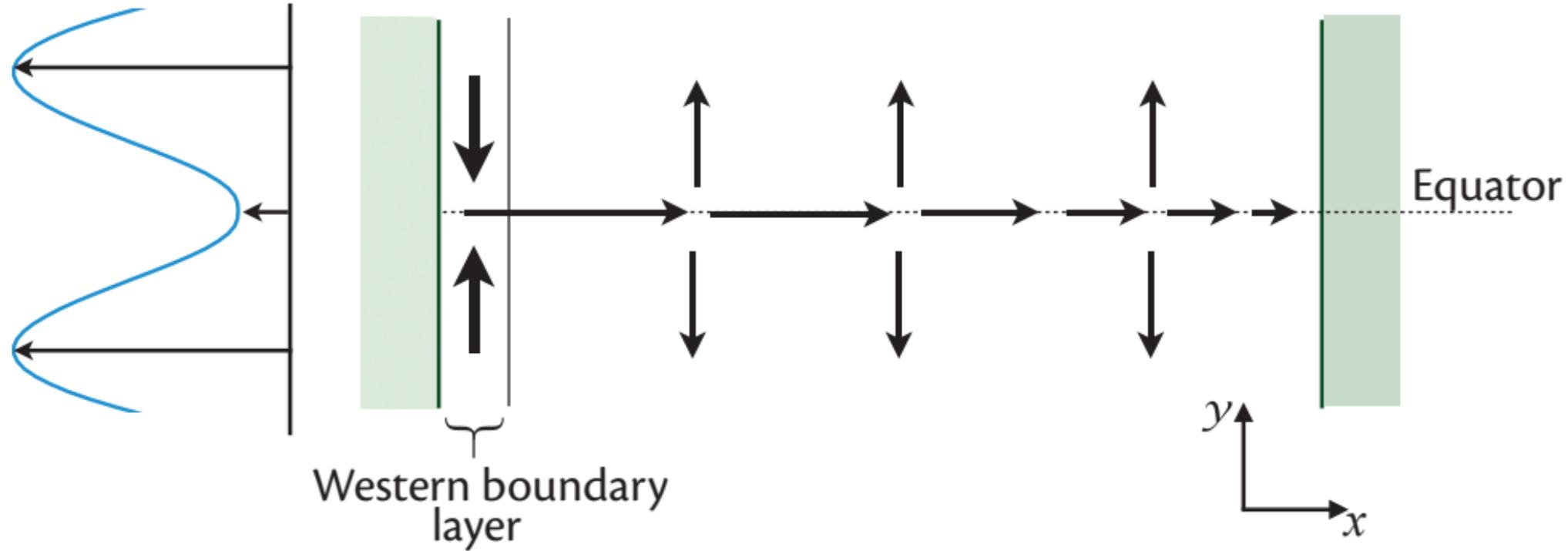


Fig. 22.3

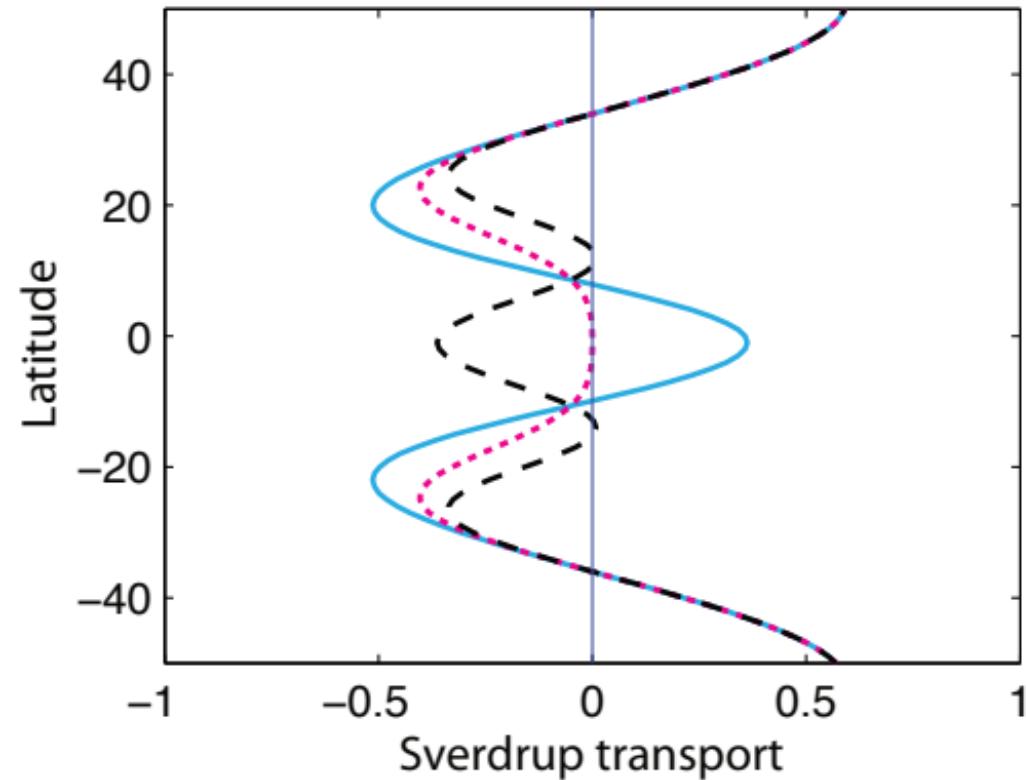
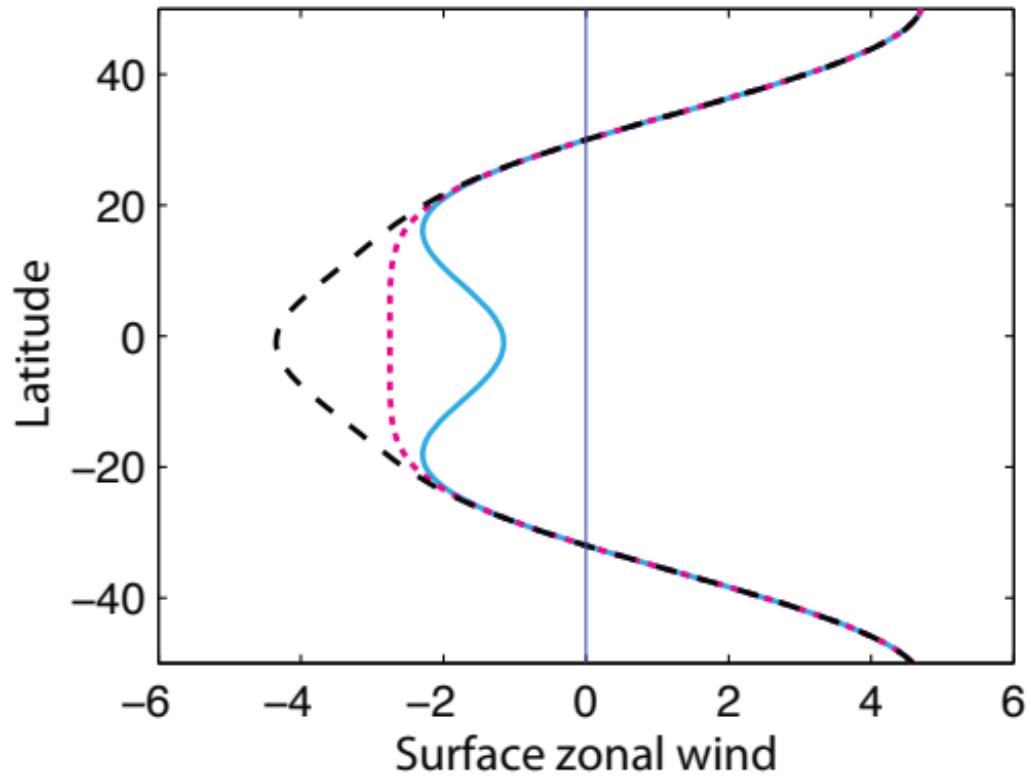


Fig. 22.4

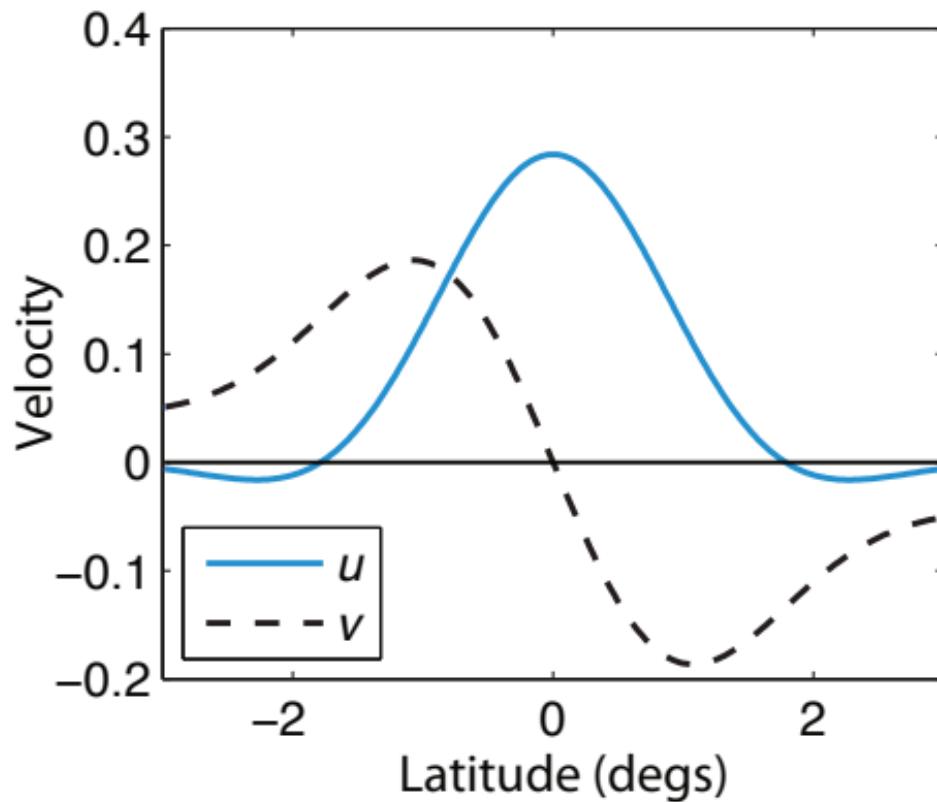
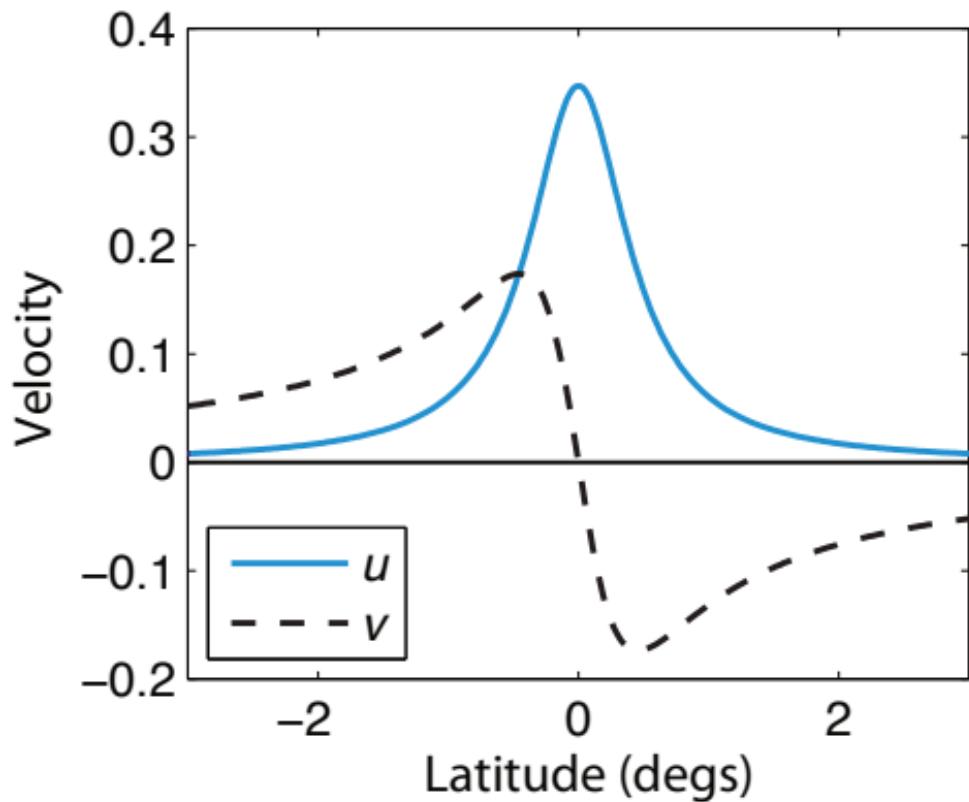


Fig. 22.5

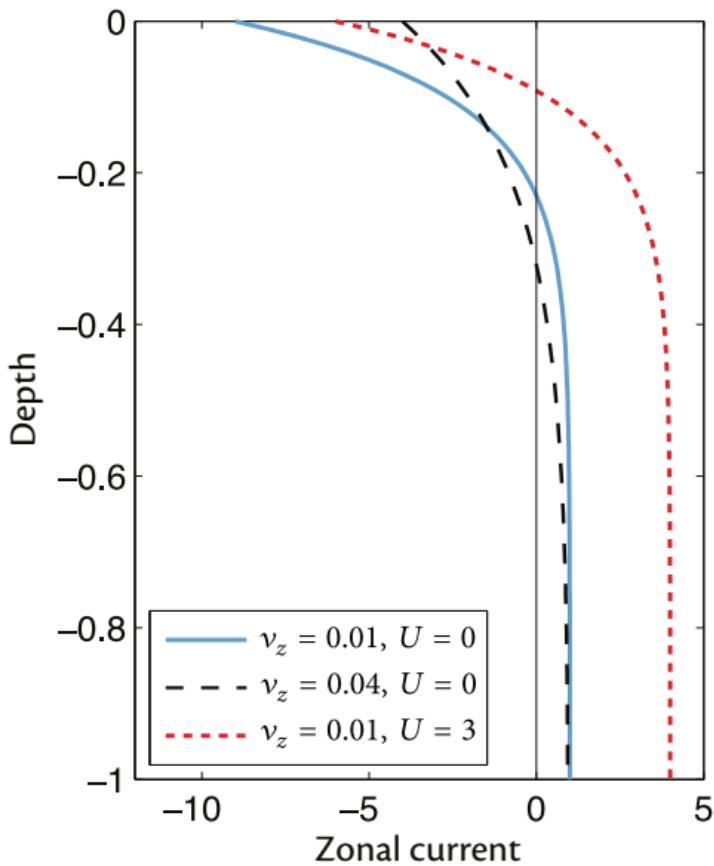


Fig. 22.6

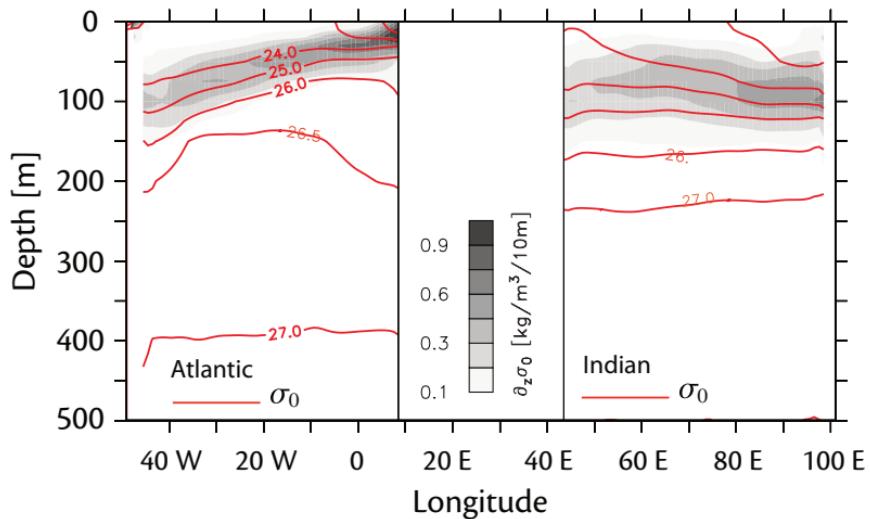
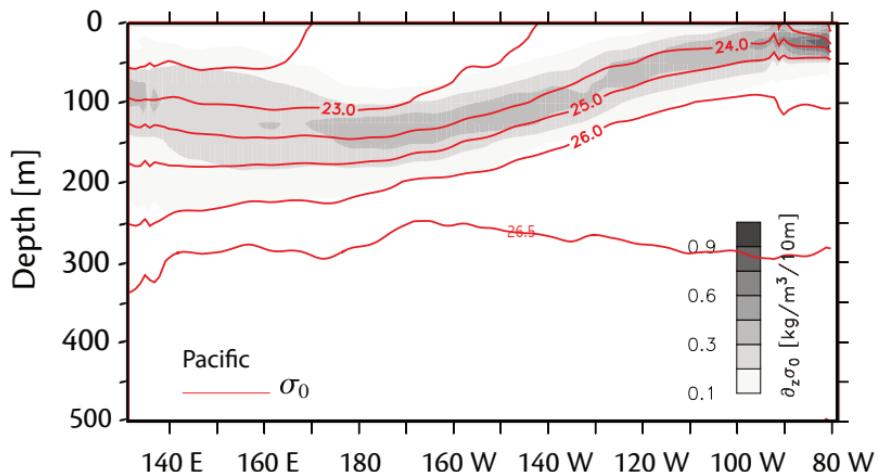


Fig. 22.7

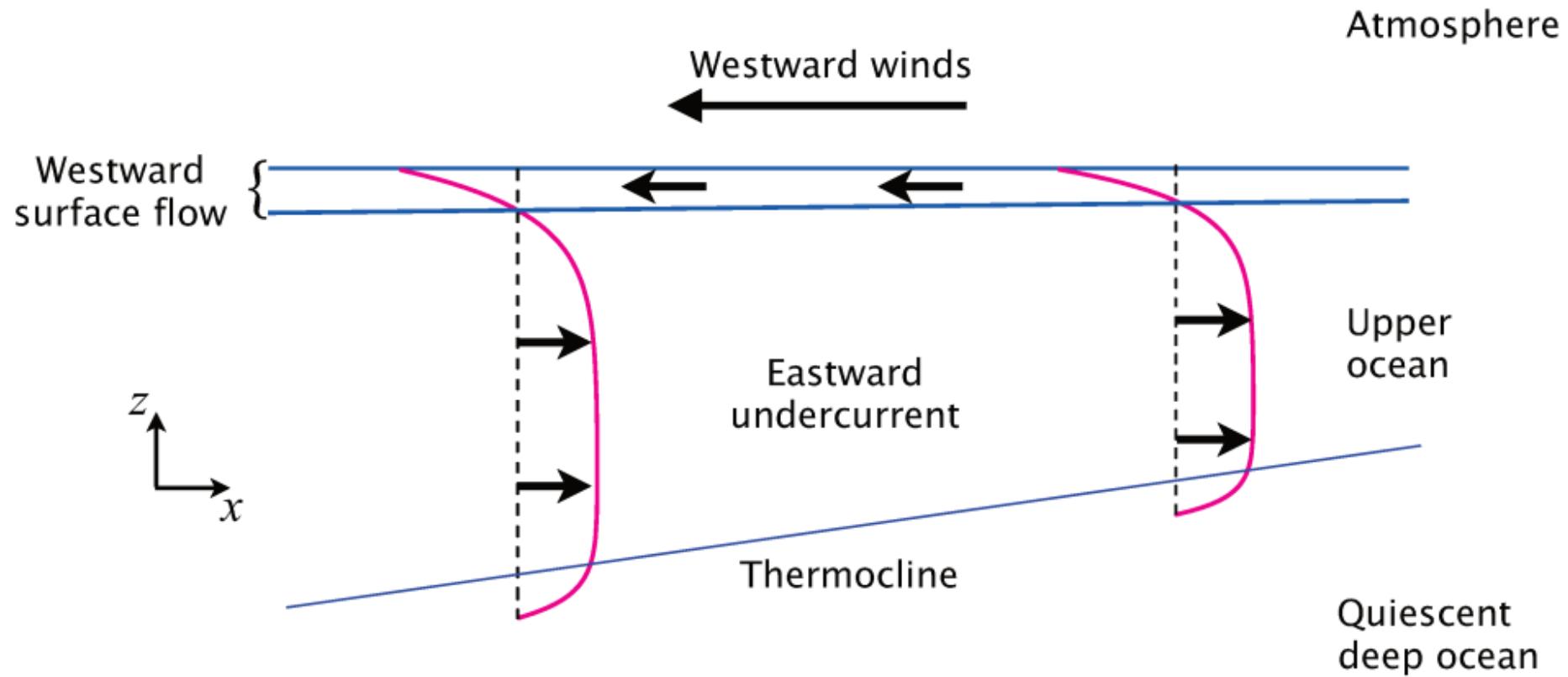


Fig. 22.8

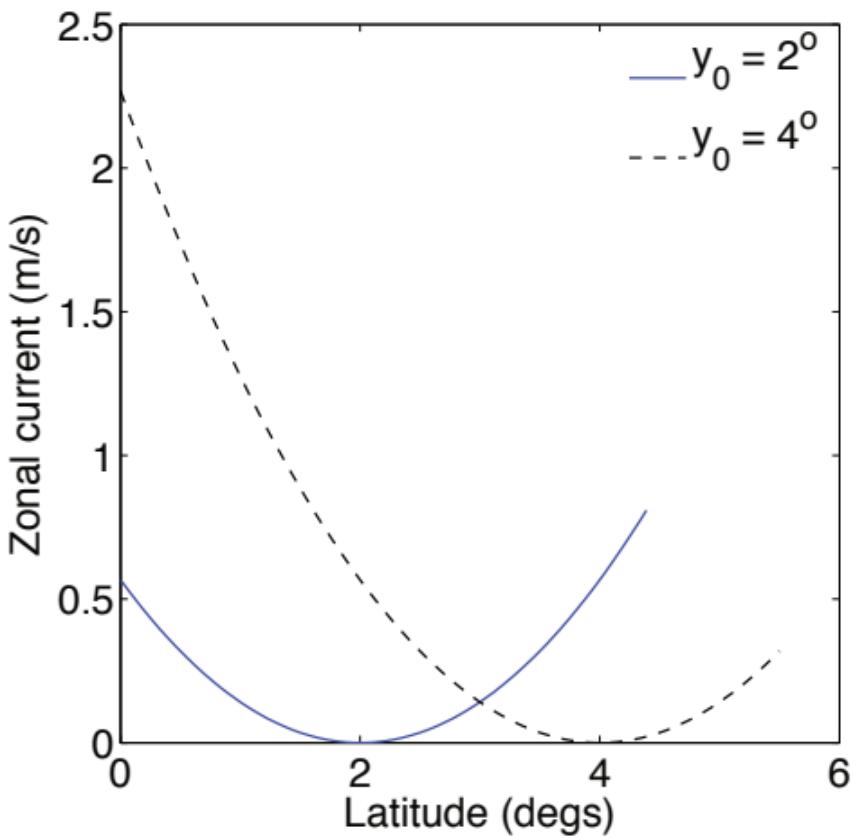


Fig. 22.9

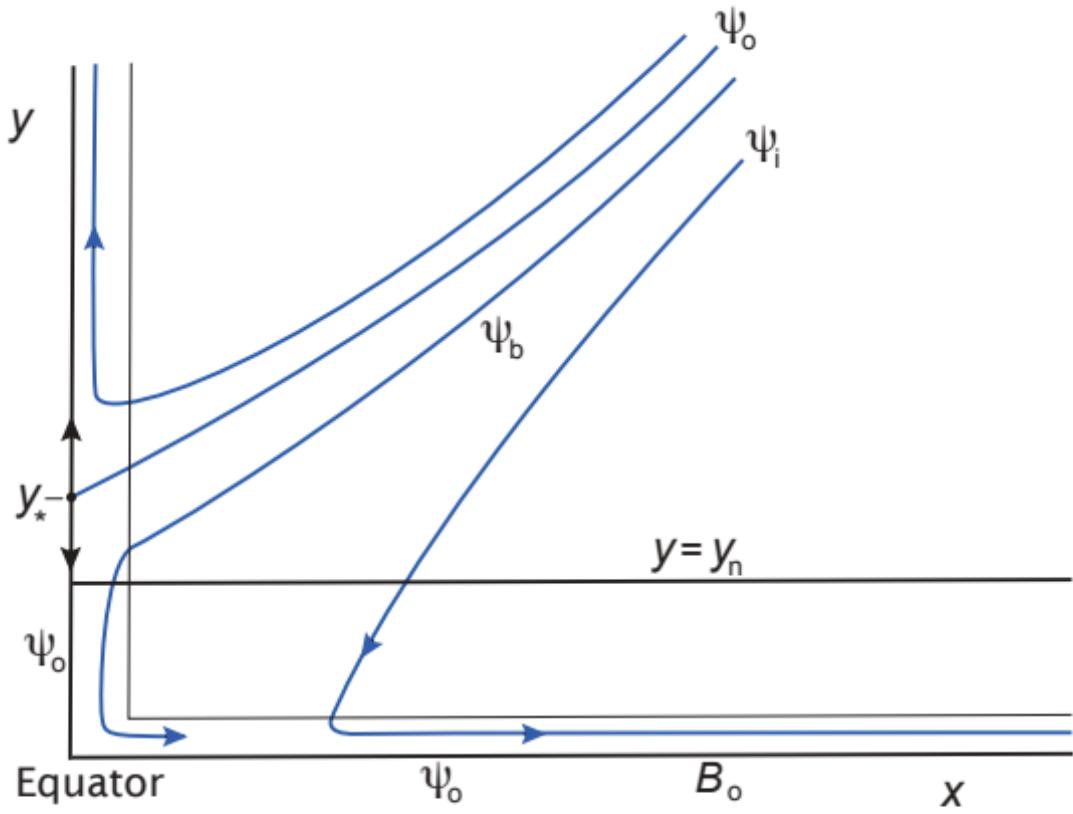


Fig. 22.10

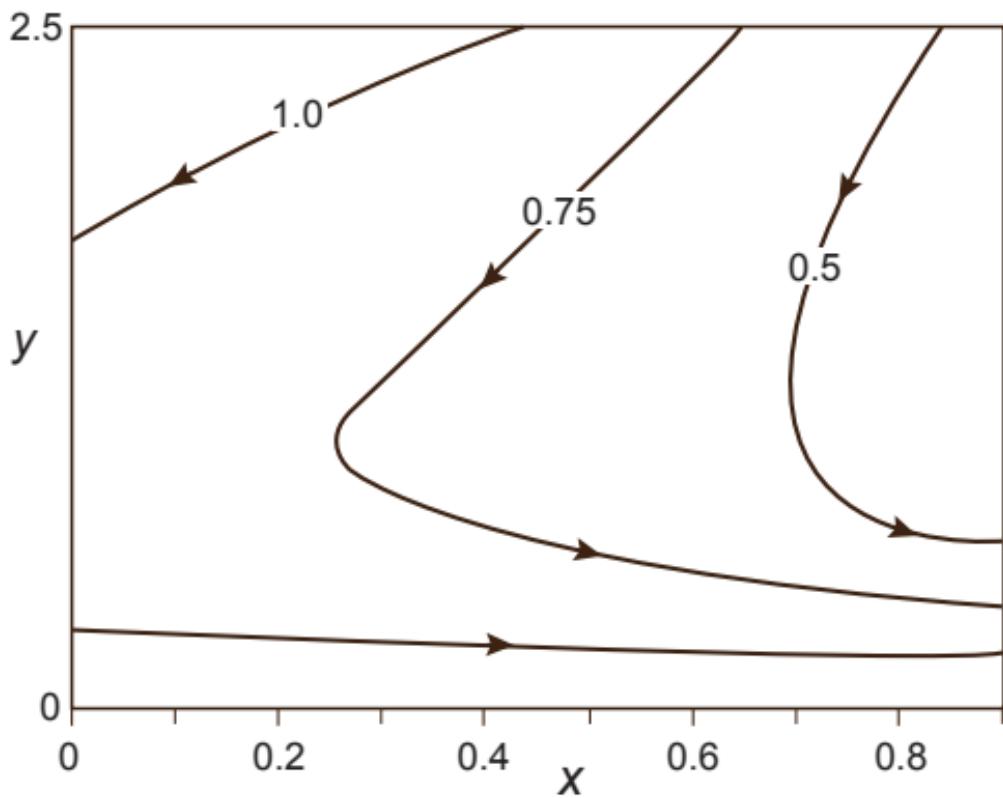


Fig. 22.11

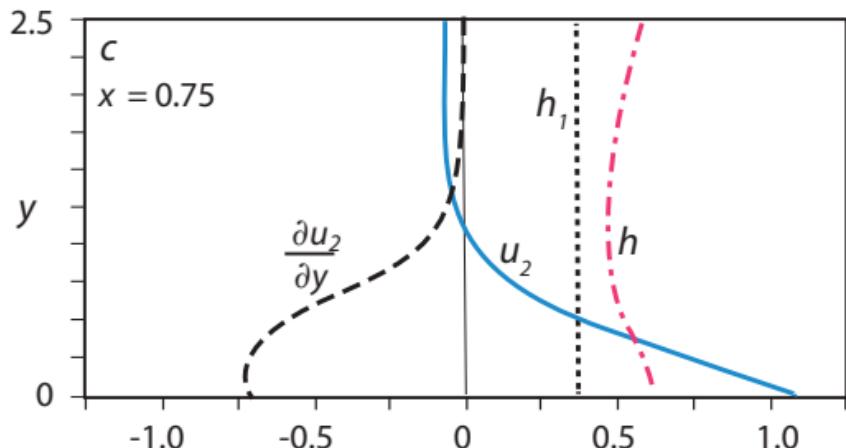
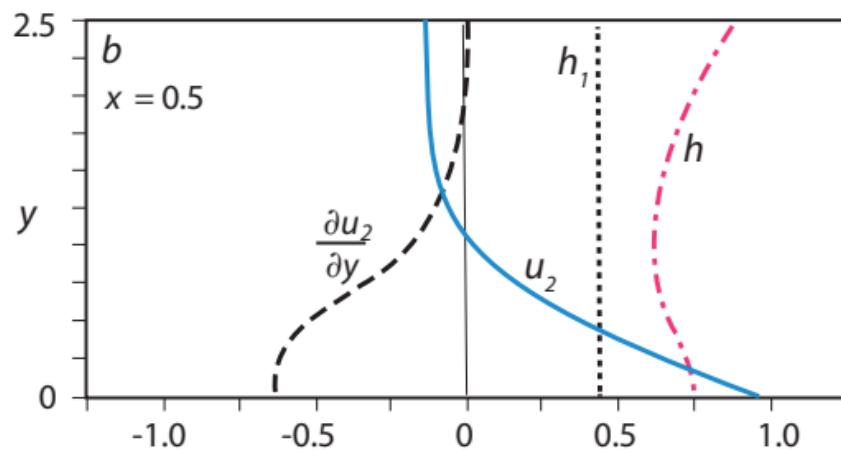
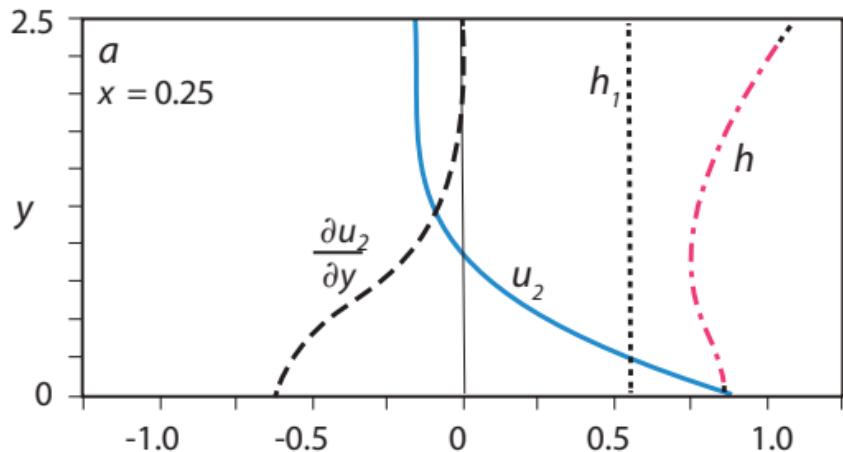
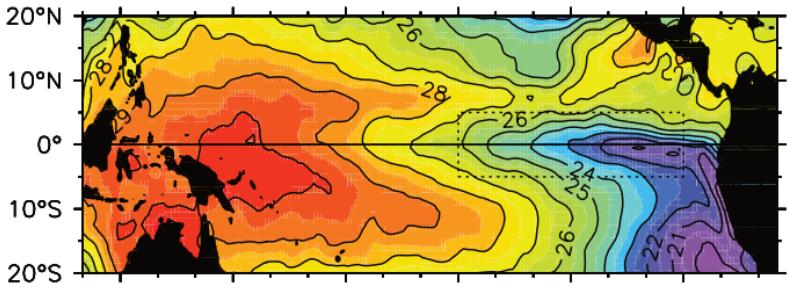
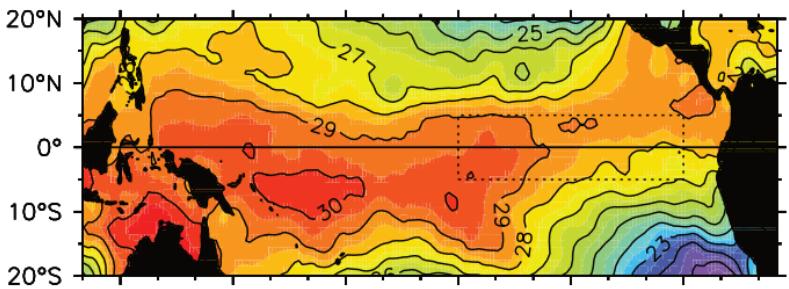


Fig. 22.12

(a) SST, 'Normal' (December 1996)



(b) SST, El Niño (December 1997)



(b) - (a) SST, El Niño anomaly

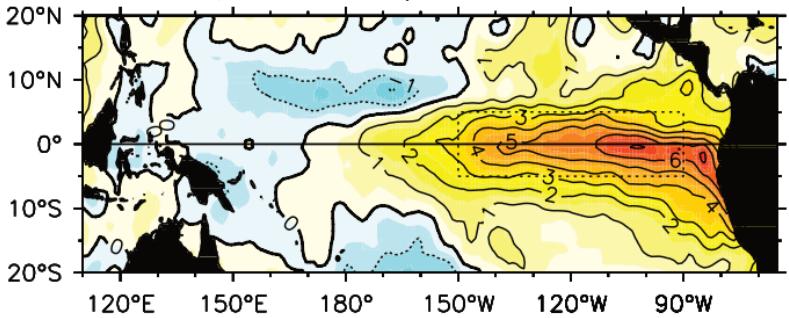


Fig. 22.13

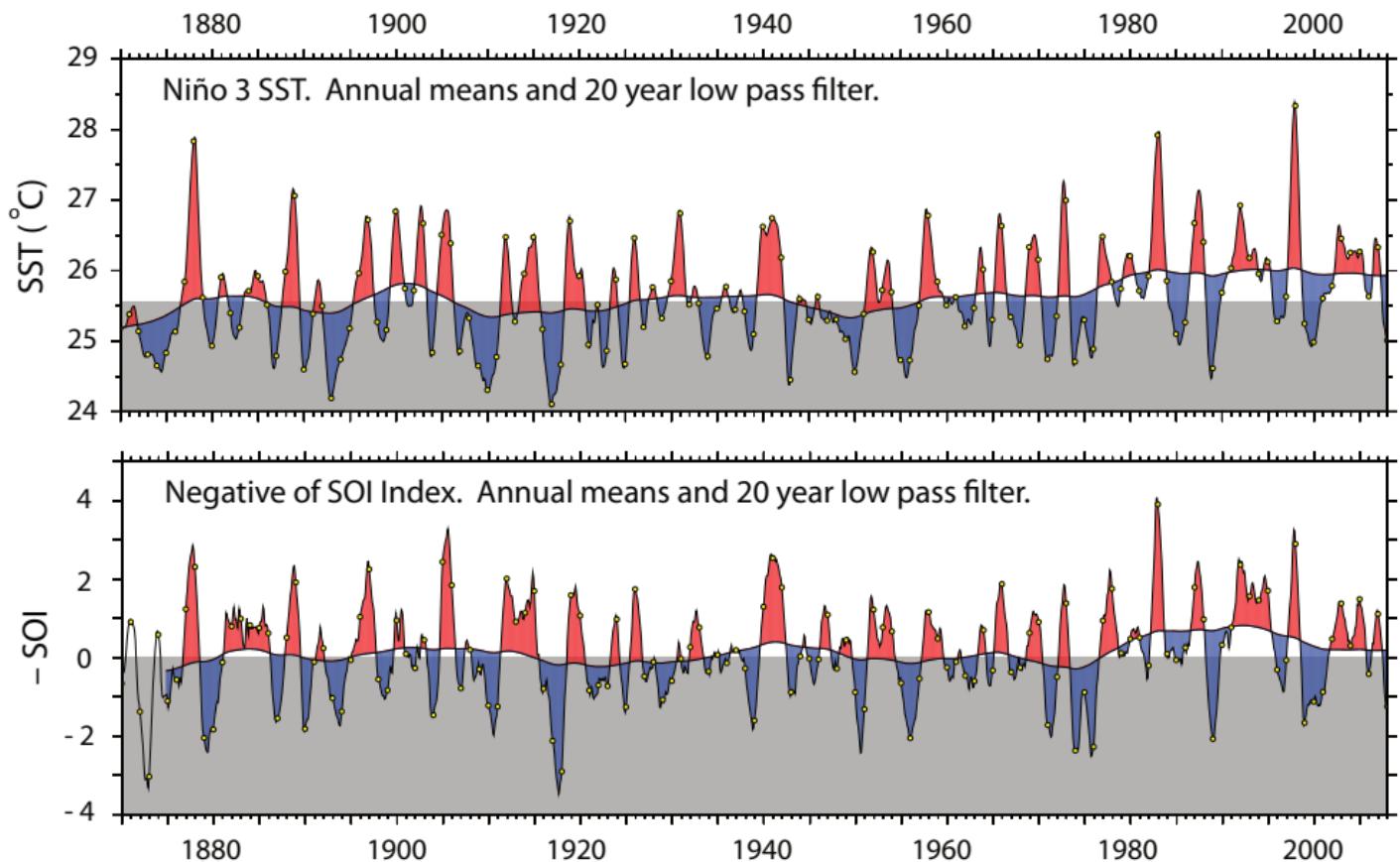


Fig. 22.14

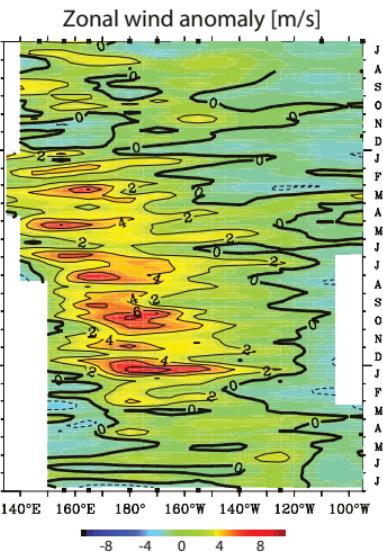
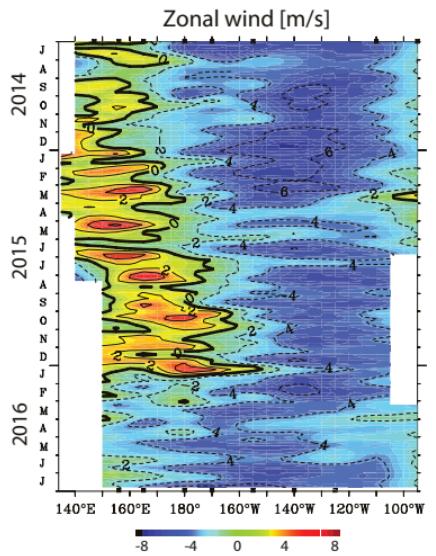
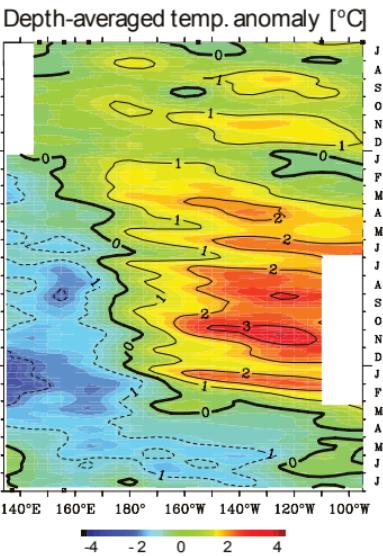
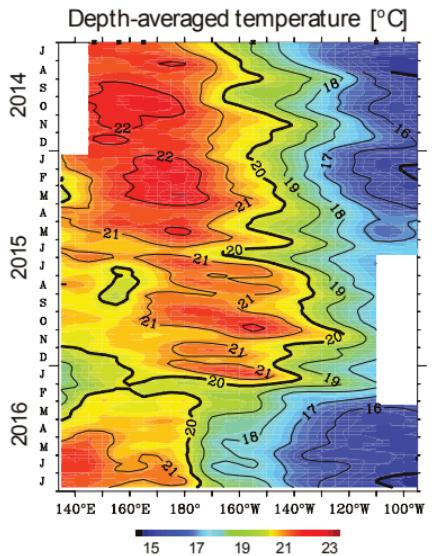


Fig. 22.15

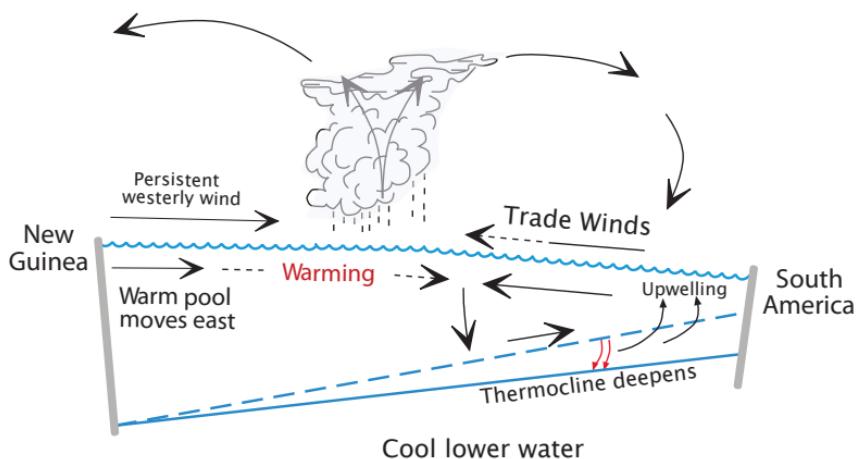
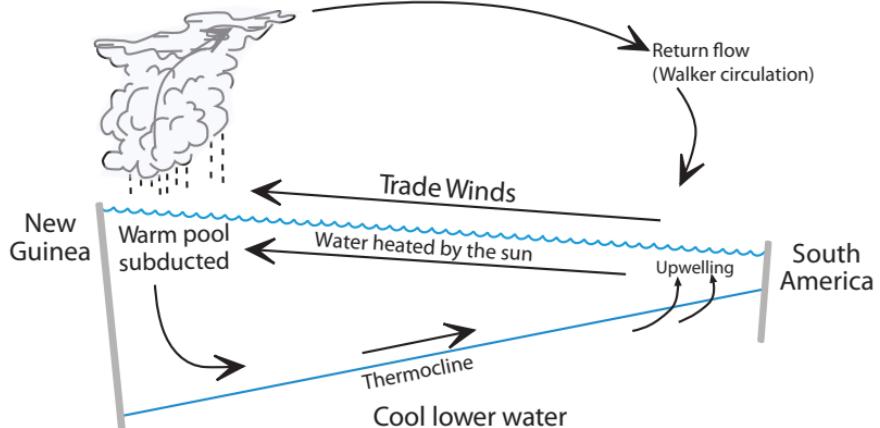


Fig. 22.16

Velocity and divergence

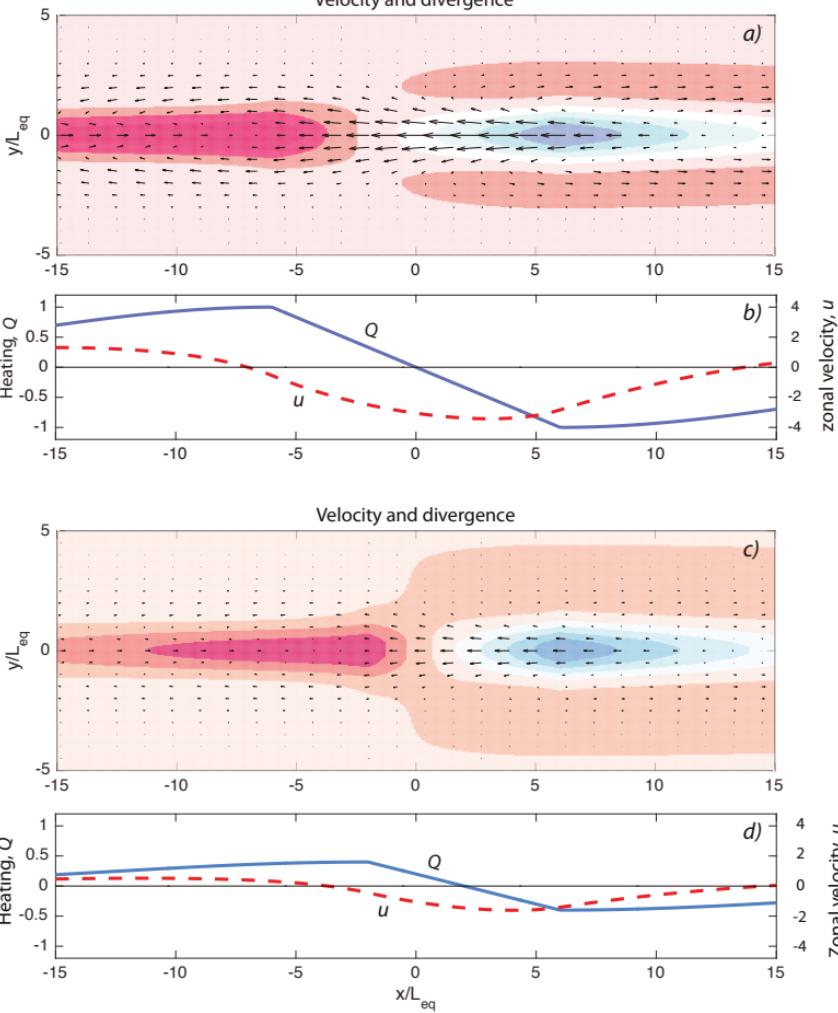


Fig. 22.17

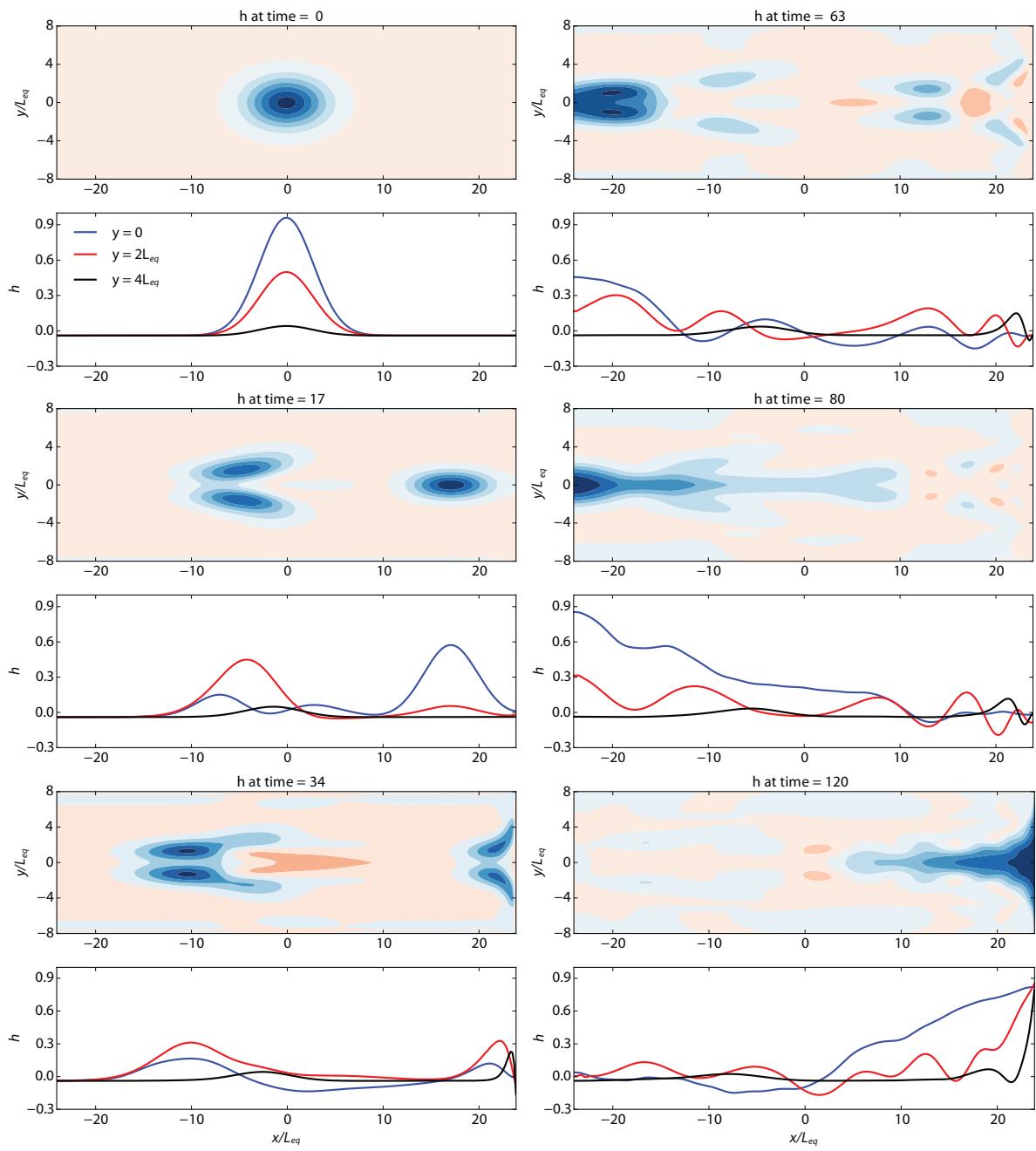


Fig. 22.18

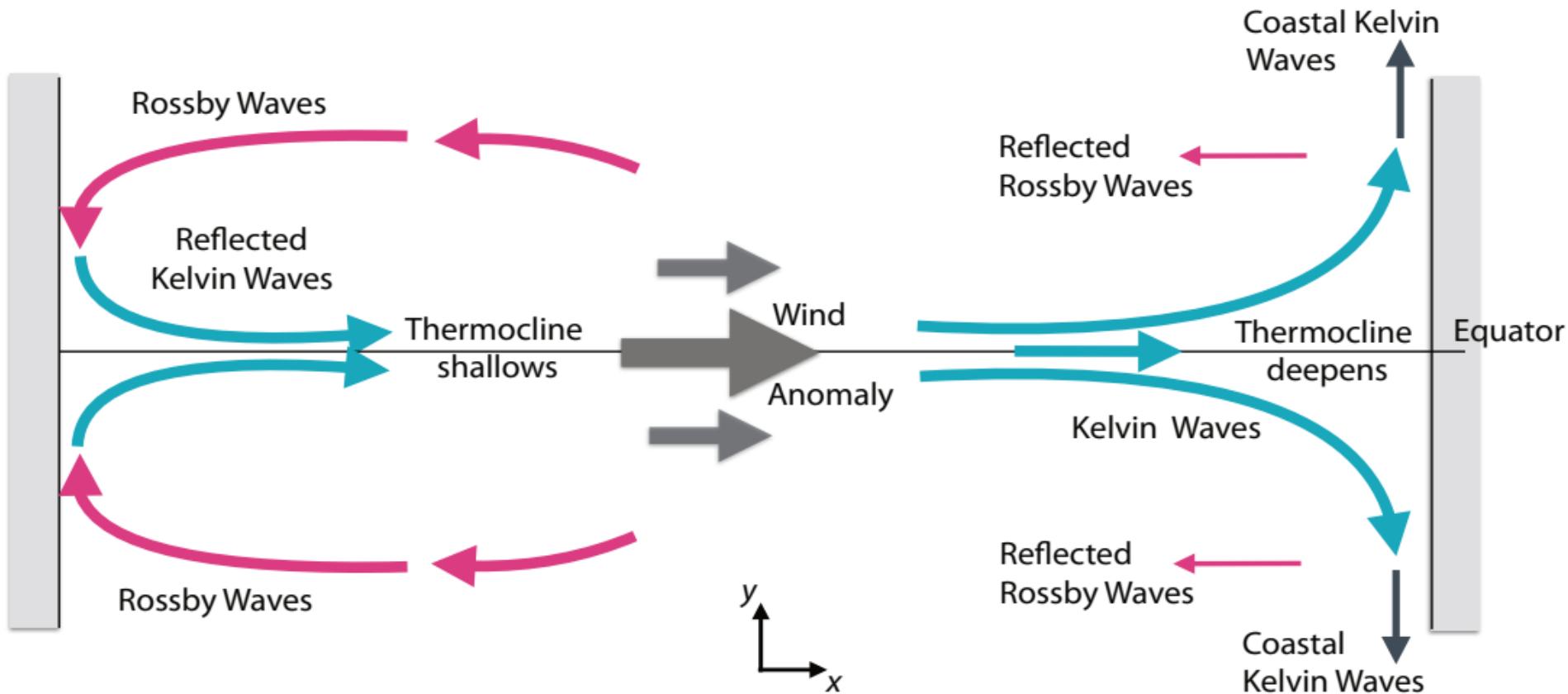


Fig. 22.19

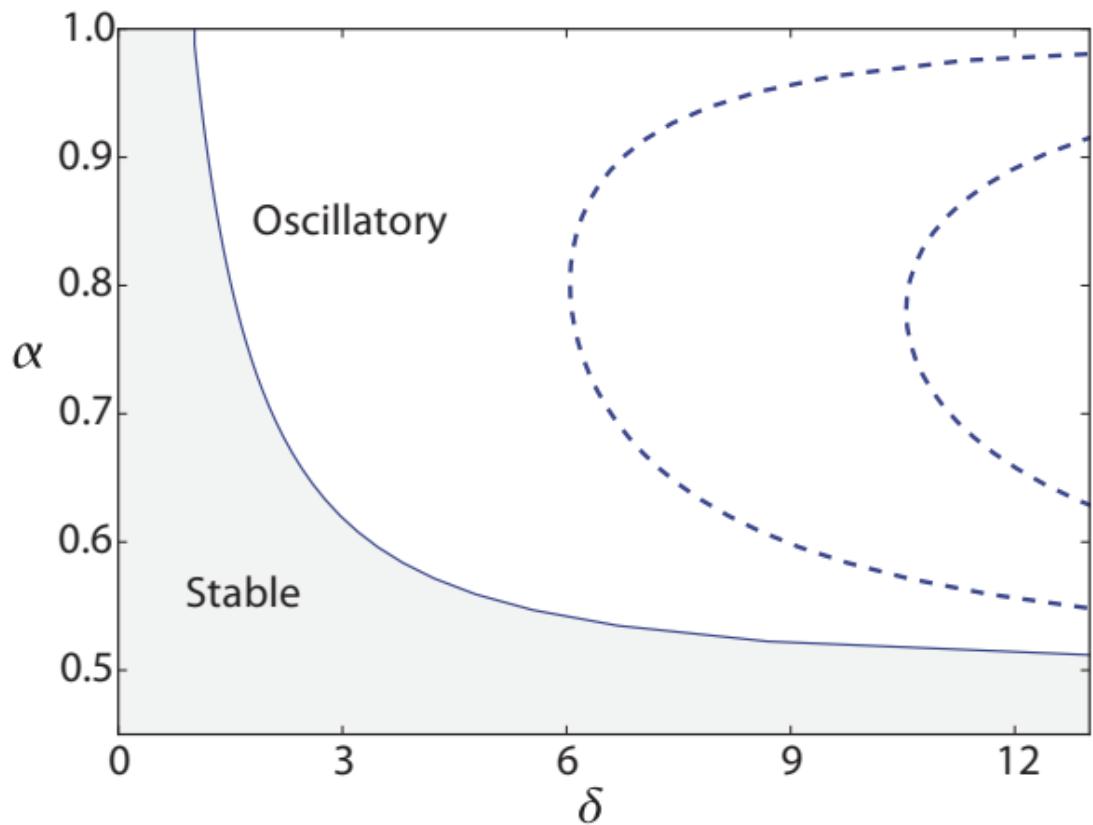


Fig. 22.20

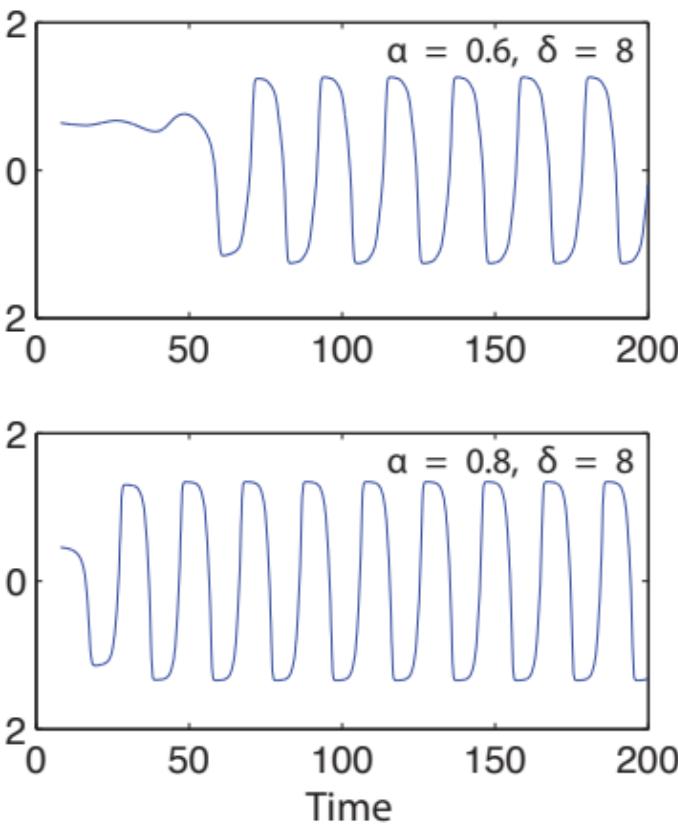
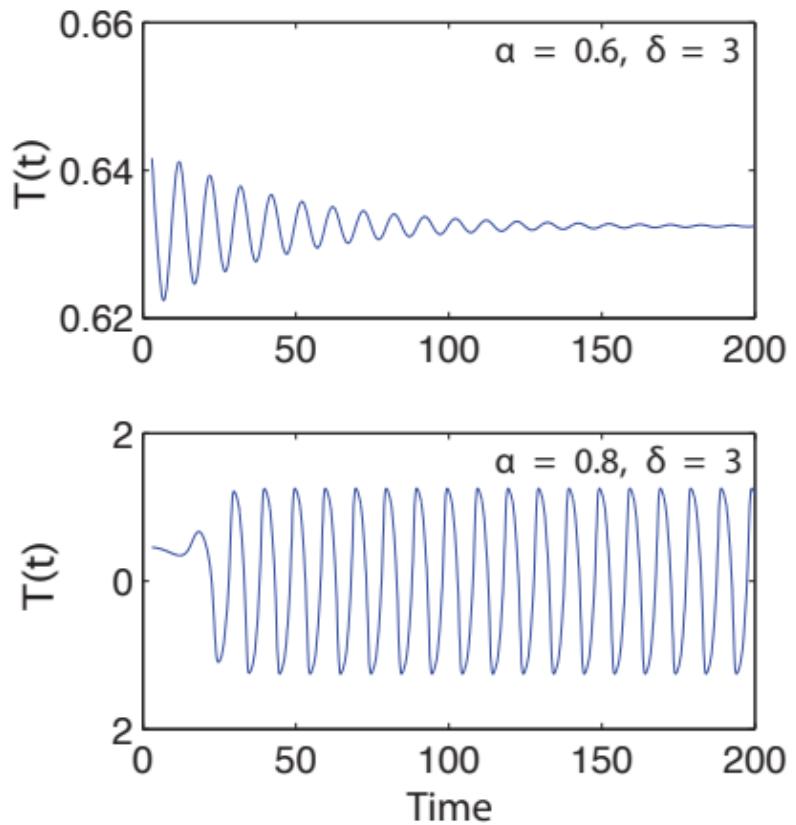


Fig. 22.21

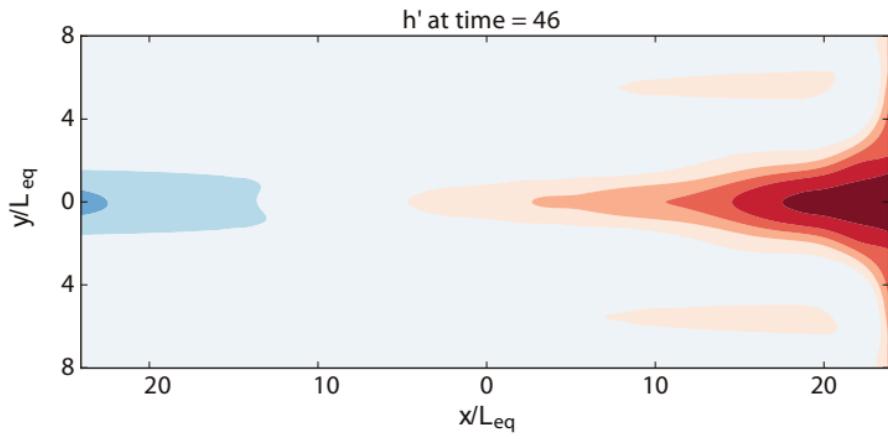
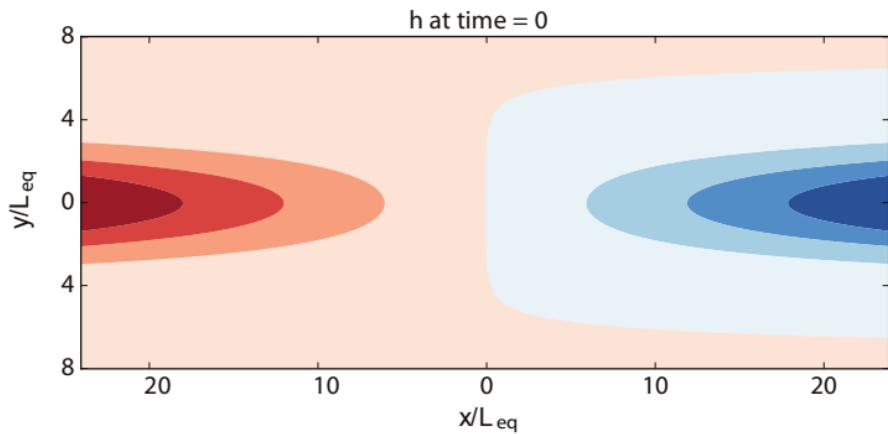


Fig. 22.22

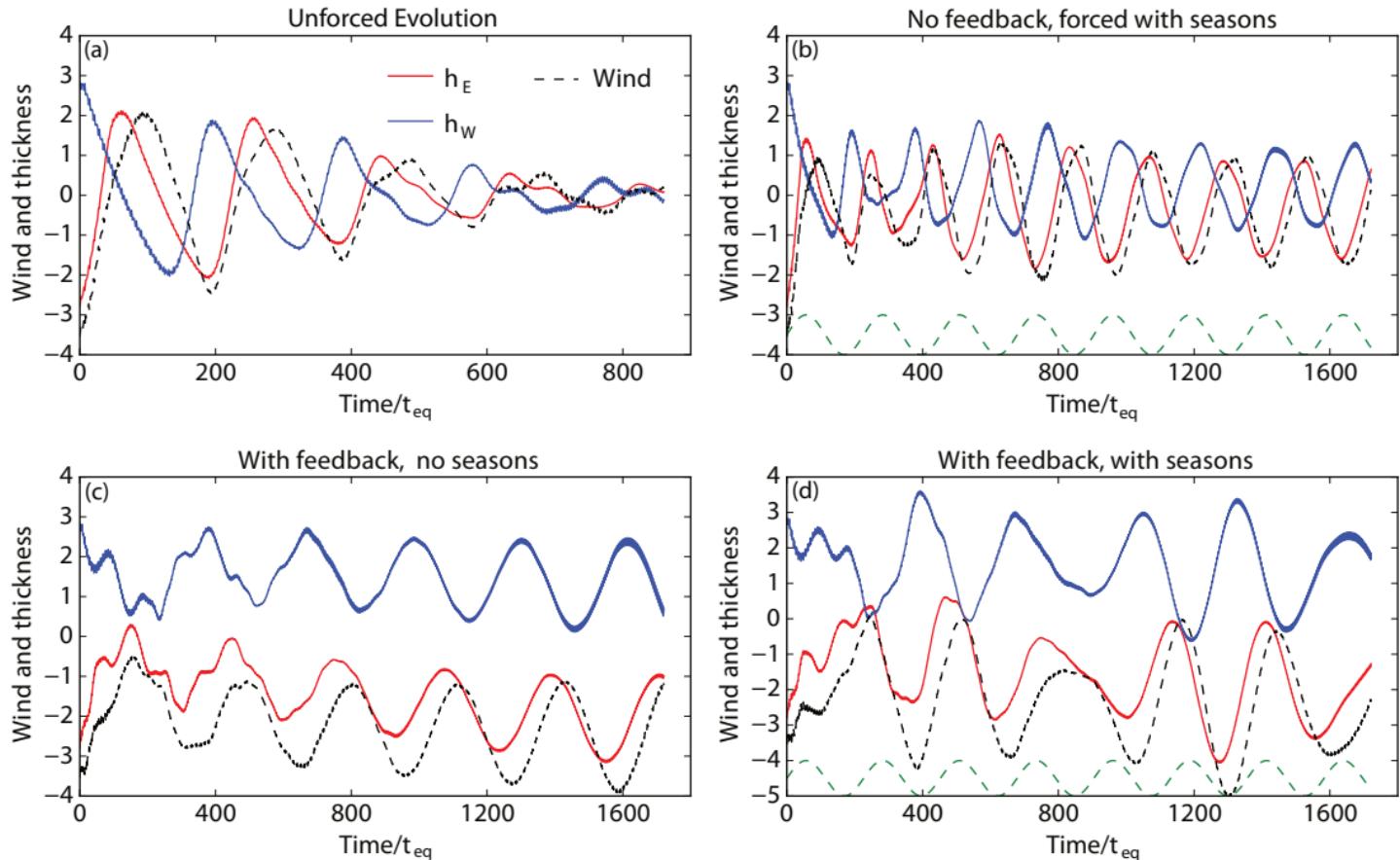


Fig. 22.23