

2020 Corrections

1) Ch.3 , page 59 Eq. 3.79: remove +C from the second term (correct version is shown below)

$$\Phi = \int q_{\theta} r d\theta = -\frac{\Gamma}{2\pi} \theta + C \quad (3.79)$$

2) Ch. 6, page 139 Eq. 6.71a: The last term in the bottom is *sin* and not *cos* (correct version is shown below)

$$x = (a \cos \theta - \frac{\epsilon C}{4}) [1 + \frac{\frac{C^2}{16}}{(a \cos \theta - \frac{\epsilon C}{4})^2 + a^2 \sin^2 \theta}] \quad (6.71a)$$

3) Ch. 8, page 178: add d in front of $\Gamma(y) / dy$. (correct version is shown below)

This spanwise wake vortex strength is shown schematically in Fig. 8.11. It is clear from this figure that near the wing tips, where $|d\Gamma(y) / dy|$ is the largest, the wake

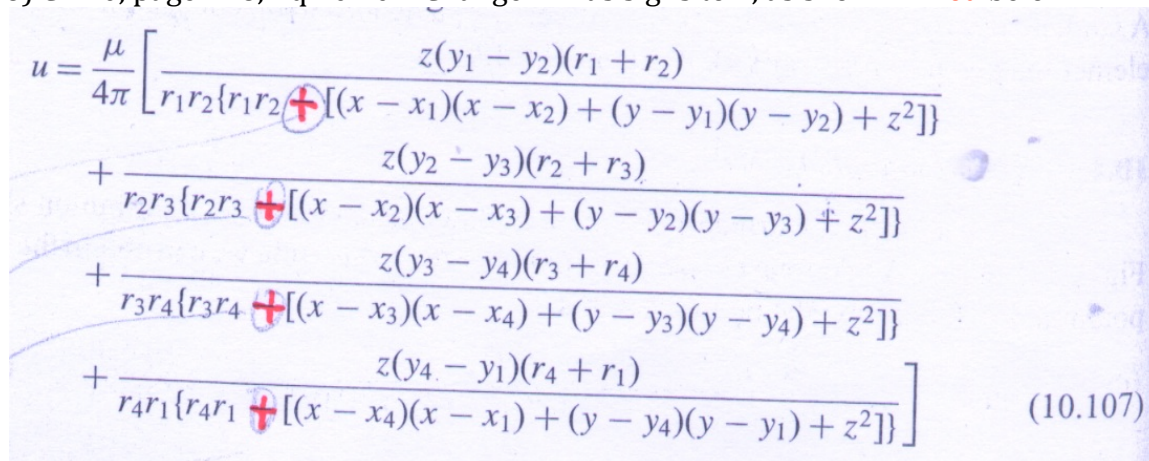
4) Ch. 10, page 236 Eq 10.33: Remove minus sign after the + sign. . (correct version is shown below)

$$w(x, 0\pm) = \frac{\mu}{2\pi} \left[\frac{1}{(x-x_1)} - \frac{1}{(x-x_2)} \right]$$

5) Ch 10, page 248, Eq. 10.105: add a minus sign ahead of the first term. (correct version is shown below).

$$\Phi = \frac{-\mu}{4\pi} \left[\tan^{-1} \left(\frac{m_{12} e_1 - h_1}{z r_1} \right) - \tan^{-1} \left(\frac{m_{12} e_2 - h_2}{z r_2} \right) \right]$$

6) Ch 10, page 248, Eq 10.107. Change minus signs to +, as shown in red below:



The image shows a handwritten correction of equation 10.107. The original equation had minus signs between the four terms, which have been circled in red and replaced with plus signs. The corrected equation is:

$$u = \frac{\mu}{4\pi} \left[\frac{z(y_1 - y_2)(r_1 + r_2)}{r_1 r_2 \{ r_1 r_2 + [(x - x_1)(x - x_2) + (y - y_1)(y - y_2) + z^2] \}} \right. \\ + \frac{z(y_2 - y_3)(r_2 + r_3)}{r_2 r_3 \{ r_2 r_3 + [(x - x_2)(x - x_3) + (y - y_2)(y - y_3) + z^2] \}} \\ + \frac{z(y_3 - y_4)(r_3 + r_4)}{r_3 r_4 \{ r_3 r_4 + [(x - x_3)(x - x_4) + (y - y_3)(y - y_4) + z^2] \}} \\ \left. + \frac{z(y_4 - y_1)(r_4 + r_1)}{r_4 r_1 \{ r_4 r_1 + [(x - x_4)(x - x_1) + (y - y_4)(y - y_1) + z^2] \}} \right] \quad (10.107)$$

7) Ch 10, page 249, Eq 10.108 and Eq. 10.109. Change minus signs to +, as shown in red below:

$$\begin{aligned}
v = \frac{\mu}{4\pi} & \left[\frac{z(x_2 - x_1)(r_1 + r_2)}{r_1 r_2 \{r_1 r_2 + [(x - x_1)(x - x_2) + (y - y_1)(y - y_2) + z^2]\}} \right. \\
& + \frac{z(x_3 - x_2)(r_2 + r_3)}{r_2 r_3 \{r_2 r_3 + [(x - x_2)(x - x_3) + (y - y_2)(y - y_3) + z^2]\}} \\
& + \frac{z(x_4 - x_3)(r_3 + r_4)}{r_3 r_4 \{r_3 r_4 + [(x - x_3)(x - x_4) + (y - y_3)(y - y_4) + z^2]\}} \\
& \left. + \frac{z(x_1 - x_4)(r_4 + r_1)}{r_4 r_1 \{r_4 r_1 + [(x - x_4)(x - x_1) + (y - y_4)(y - y_1) + z^2]\}} \right] \quad (10.108)
\end{aligned}$$

$$\begin{aligned}
w = \frac{\mu}{4\pi} & \left[\frac{[(x - x_2)(y - y_1) - (x - x_1)(y - y_2)](r_1 + r_2)}{r_1 r_2 \{r_1 r_2 + [(x - x_1)(x - x_2) + (y - y_1)(y - y_2) + z^2]\}} \right. \\
& + \frac{[(x - x_3)(y - y_2) - (x - x_2)(y - y_3)](r_2 + r_3)}{r_2 r_3 \{r_2 r_3 + [(x - x_2)(x - x_3) + (y - y_2)(y - y_3) + z^2]\}} \\
& + \frac{[(x - x_4)(y - y_3) - (x - x_3)(y - y_4)](r_3 + r_4)}{r_3 r_4 \{r_3 r_4 + [(x - x_3)(x - x_4) + (y - y_3)(y - y_4) + z^2]\}} \\
& \left. + \frac{[(x - x_1)(y - y_4) - (x - x_4)(y - y_1)](r_4 + r_1)}{r_4 r_1 \{r_4 r_1 + [(x - x_4)(x - x_1) + (y - y_4)(y - y_1) + z^2]\}} \right] \quad (10.109)
\end{aligned}$$

8) Ch. 11, page 281, Eq. 11.30 and 11.31: change signs on both equations. (correct version is shown below).

$$u_p = \frac{-\mu}{2\pi} \left[\frac{z}{(x - x_1)^2 + z^2} - \frac{z}{(x - x_2)^2 + z^2} \right] \quad (11.30)$$

$$w_p = \frac{\mu}{2\pi} \left[\frac{x - x_1}{(x - x_1)^2 + z^2} - \frac{x - x_2}{(x - x_2)^2 + z^2} \right] \quad (11.31)$$

9) Ch 11, page 282, Eq. 11.35, remove minus sign

$$w_p(x, 0\pm) = \frac{\mu}{\pi} \frac{2}{(x_2 - x_1)} \quad (11.35)$$

10) Ch 11, page 282, Eq. 11.35a, remove minus sign

$$a_{ii} = \frac{2}{\pi \Delta c_i} \quad (11.35a)$$

11) Ch 11, page 303 second line of Eq. 11.97. Correct version is shown below

$$-\frac{\gamma_1}{4\pi} \left[z \ln \frac{(x - x_1)^2 + z^2}{(x - x_2)^2 + z^2} - 2x \left(\tan^{-1} \frac{z}{x - x_2} - \tan^{-1} \frac{z}{x - x_1} \right) \right] \quad (11.97)$$

12) Ch 11, page 317, 17 lines from bottom. Subscript for last term should be **21** and not 12. Correct version is shown below:

$$(\Phi_1^a \mu_o + \Phi_1^b \mu_1 + \Phi_1^c \mu_2)_1 \equiv a_{11} \mu_{o1} + b_{11} \mu_{11} + c_{11} \mu_{21}$$

13) Ch 13, page 415, E. 13130, add a minus sign inside the parentheses, as shown

$$D = \sum_{j=1}^N \rho(-w_{w_j} \Gamma_j + \frac{\partial}{\partial t} \sum_{k=1}^j \Gamma_k \Delta l_k \sin \alpha_k) \quad (13.130)$$

14) Appendix A, page 537, Eq 7. Missing ξ above division line. Correct formula is shown below:

$$\oint_{-1}^1 \frac{\xi}{\sqrt{1-\xi^2} (x-\xi)} d\xi = -\pi$$