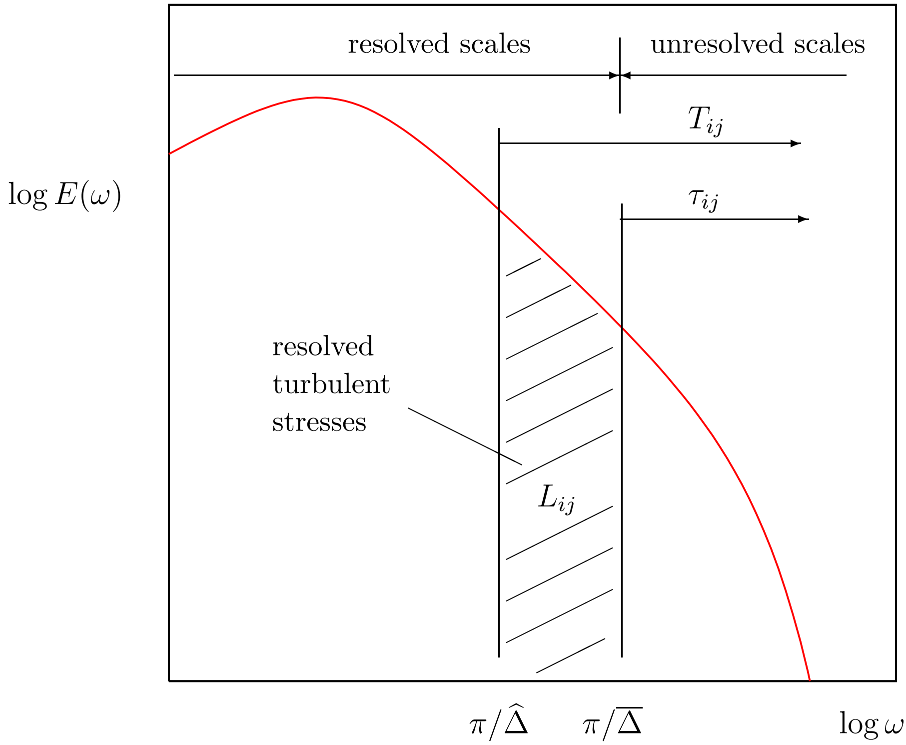

Figure 5: Illustration of the dynamic modelling idea as discussed in the text.

yields an effective filter of width $\widehat{\overline{\Delta}} \neq \widehat{\Delta}$, which generally is even of different type to $\widehat{G}$ and $\overline{G}$ (e.g. when the box filter is used). This issue is generally neglected in the literature. For that reason and since $\widehat{\overline{\Delta}} = \widehat{\Delta}$, with the Fourier cutoff filter presently used for illustration, we write $\widehat{\Delta}$ instead of $\widehat{\overline{\Delta}}$ in this section. Effectively, it is the ratio $\widehat{\overline{\Delta}}/\overline{\Delta}$ which is required by the dynamic models.

We now apply the dynamic procedure to the SM (10),(13) to get

$$L_{ij}^{\mathrm{mod}} = -2\, C\, \widehat{\Delta}^2 |\widehat{\overline{S}}| \widehat{\overline{S}}_{ij} + \widehat{2\, C\, \overline{\Delta}^2 |\overline{S}| \overline{S}_{ij}} \tag{21}$$

with $C = C_s^2$ for convenience. Classically, the model is developed by extracting C from the filtered expression in the second term although in fact C will vary in space. The right-hand side of (21) can then be written as $-2CM_{ij}$ so that inserting into (20) with the least-squares minimization mentioned above yields

$$C = -\frac{1}{2} \frac{L_{ij}\, M_{ij}}{M_{ij}\, M_{ij}}. \tag{22}$$

The advantage of (22) or a similar equation is that now the parameter of the SM is no longer required from the user but is determined by the model