5.4 Dimensionality

We saw above that, in 3D, the fundamental solution to the Stokes equations for a point force at the origin is given by the Oseen solution

$$u_i(\boldsymbol{x}) = G_{ij}(\boldsymbol{x})\ F_j\ , \qquad p(\boldsymbol{x}) = \frac{F_j x_j}{4\pi|\boldsymbol{x}|^3} + p_\infty, \tag{5.50a}$$

where

$$G_{ij}(\boldsymbol{x}) = \frac{1}{8\pi\mu\,|\boldsymbol{x}|}\left(\delta_{ij} + \frac{x_i x_j}{|\boldsymbol{x}|^2}\right), \tag{5.50b}$$