**Turbulent Flows**
Stephen B. Pope
*Cambridge University Press* (2000)

# Solution to Exercise 7.8

*Prepared by:* Michael Stumpf *Date:* 12/08/17

From Fig. 7.18, we can directly infer that

$$\varepsilon_0^+ \approx 0.22.$$

The Kolmogorov length scale is

$$\begin{aligned}
\eta &\overset{(5.149)}{\equiv} \left(\frac{\nu^3}{\varepsilon}\right)^{1/4} \\
&\overset{(7.26)}{=} \left(\frac{\delta_v^3 u_\tau^3}{\varepsilon}\right)^{1/4} \\
&= \left(\frac{\delta_v \varepsilon}{\delta_v^4 u_\tau^3}\right)^{-1/4} \\
&= \delta_v (\varepsilon^+)^{-1/4}.
\end{aligned}$$

Evaluating $\eta$ at the wall, using the value previously extracted from the figure, results in

$$\frac{\eta_{y=0}}{\delta_v} = (\varepsilon_0^+)^{-1/4} \approx (0.22)^{-1/4} = 1.46.$$