

Turbulent Flows
Stephen B. Pope
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Solution to Exercise 13.40

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The stated assumptions let us estimate the required ratio as

$$r = \frac{\int_{\pi/\bar{\Delta}}^{\pi/\tilde{\Delta}} \kappa^{-5/3} d\kappa}{\int_{\pi/\bar{\Delta}}^{\infty} \kappa^{-5/3} d\kappa} = \left(\frac{\tilde{\Delta}}{\bar{\Delta}} \right)^{2/3} - 1. \quad (1)$$

Hence, $r = 0.59, 1.0$ for $\tilde{\Delta}/\bar{\Delta} = 2, 2.83$, respectively.

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