

Fernando Group 1

Fernando's Problem 7:

Kolmogorov microscales are the smallest scales in turbulent flow.

We have $\eta = \left(\frac{\nu^3}{\varepsilon}\right)^{1/4}$ as the Kolmogorov length scale, where ε is the average rate of energy dissipation per unit mass, and ν is the kinematic viscosity of the fluid.

Since u is the r.m.s velocity, so $\tau = \frac{\eta}{u}$ is the smallest time scale, and $\lambda = \frac{1}{\tau}$ will be the largest frequency.