MTF256 Learning outcomes: week 2

November 10, 2010

1. Derive the exact transport equation for turbulent kinetic energy, k. Discuss the physical meaning of the different terms in the k equation. Which is the main source and sink term, respectively? Which terms do only transport k?

2. In the cascade process, we assume that the dissipation is largest at the smallest scales, i.e. $\tau_\kappa^{-1} = \left(\frac{\ell_\kappa}{\ell_0}\right)^{-2/3} \tau_0$, see Eq. 8.16 at p. 60. Show this. For which eddies is the production largest? Why?

3. Know the general design of a wind tunnel and the general sources of disturbances of the flow field (like blockage, turbulence level, moving ground, stings, etc.)

4. Understand and being able to analyse how screens and contractions affect the turbulence level in a wind tunnel.