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| 1. The nature of turbulent flows |
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| 2. The Kolmogorov’s similarity hypothesis. Restatement of the Kolmogorov hypotheses. |
| 3. Structure functions. Two-point correlation. The Karman-Howarth equation. Exercises |
| 4. Parameterization isotropic turbulence |
| 5. The spectral view of the energy cascade. The energy spectrum balance. The cascade timescale. Spectral energy-transfer models. |
| 6. The turbulent viscosity hypothesis. The gradient diffusion hypothesis. |
| 7. The mixing length model. Turbulent kinetic energy models. |
| 8. The standard two equation model. |
| 9. Nonlinear eddy viscosity models. |
| Exercises 2.2-6.33 |
| 10. Implicit algebraic stress model. |
| 11. Turbulence decomposition. Equations for the mean flow and the turbulent stresses. |
| 12. Reynolds stress closure. The pressure rate of strain tensor. Rotta’s model. |
| 13. Rapid distortion theory |
| 14. A Reynolds stress transport. |
| 15. Velocity spectra. Kolmogorov spectra. Dissipation spectra. |
| Exercises 11.1-11.28 |

Exercises by subjeck