

Department of Mechanical Engineering

ME537 Multiphase Flows

Homework 3. Due 12-02-18

Read Section 12.6 of the Multiphase Flow Handbook. Then, use the concepts you have learned about the influence that particles have on turbulence in the carrier phase to understand these two papers:

“On the two way interaction between homogeneous turbulence and small solid particles: Turbulence Modification”, by S. Elghobashi and G.C. Truesdell. *Physics of Fluids A*, **5** (7) 1993, and

“Classification of turbulence modification by dispersed spheres using a novel dimensionless number” by T. Tanaka, and J.K. Eaton, *Phys. Rev. Let.* **101** (11), 114502, 2008.

- Comment on the methodologies used with the advantages and disadvantages presented by the research tools used. Keep in perspective that these two articles were published 15 years apart.
- Discuss the effect of the particles on the turbulence and how gravity influence the particle-turbulence interactions.