

Climate & Sustainability

PHYS 189

Fall 2017

Problem Assignment # 5

due 10-13-17

- What is the difference between sensible heat and latent heat?
 - Describe a process that results in net transport of sensible heat from the surface to the atmosphere.
 - Describe a process that results in net transport of latent heat from the surface to the atmosphere.
- What is the difference between advection and convection?
- What is the difference between energy transport in large scale motion (e.g. advection) compared to small scale transport by eddy fluxes? It may help to draw a picture.
- What are 2 important examples of how eddy fluxes affect global circulation?
- What is the “boundary layer” (also called the planetary boundary layer or atmospheric boundary layer)? What is the “free troposphere”?
- Turbulent mixing homogenizes some quantities but not others. Give two examples of quantities that are homogenized by turbulent mixing, and two examples of quantities that are not.
- Define *dry static energy* (write down the equation for dry static energy and describe what the terms in the expression represent). It is approximately conserved in processes that do not involve phase changes. Explain how this can happen.