

Ocean circulation: quiz 3

This quiz aims at testing your knowledge regarding the most fundamental aspects of lecture 2. Qualitative statements are expected.

1. **Physical laws.** What physical laws are the necessary and sufficient set of equations to resolve ocean circulation?
2. **Continuity.** What is the relation between mass conservation and volume conservation in a Boussinesq ocean?
3. **Rotation.** What are the three effects of the Earth rotation and spherical shape on motion? Which one is the most important for ocean circulation?
4. **Tracer conservation.** Under which conditions are temperature and salinity conserved? Where is it reasonably verified in the ocean?
5. **Seawater density.** What are the main dependencies of seawater density? Which single term seems most relevant to you?
6. **Dynamic sea level.** Why does sea level matter for ocean dynamics? What determines its evolution?
7. **Reynolds average.** How many additional terms appear in the Boussinesq equations after performing a Reynolds decomposition and averaging? How do we usually represent those terms?
8. **Model grid.** What is the range of horizontal and vertical resolutions of ocean models.
9. **Vertical mixing.** What are the main parametrizations which drive vertical mixing in an ocean model?
10. **Forced ocean.** Why is it problematic to run an ocean model in a forced configuration?
11. **Sources of error.** What are the main sources of error of ocean models? How do we usually document them?