

The maintenance of stratification in the ocean and atmosphere: from conveyor belts to geostrophic turbulence.

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Keywords: *atmospheric and oceanic fluid dynamics*

We will discuss the maintenance of stratification in the ocean, comparing and contrasting with the maintenance of stratification in the atmosphere. In the upper ocean stratification is maintained by a combination of wind-driving (producing the ventilated thermocline) and an advective-diffusive processes, producing an internal thermocline. These processes are now reasonably well understood, and also have no real atmospheric analog. The deep ocean is less well understood, and its stratification seems to be maintained, at least in part, by the action of baroclinic eddies originating in the Southern Ocean. We will present an analytic theory for this along with some numerical simulations, and discuss whether the role of the eddies is comparable to the role of baroclinic eddies in the atmosphere.