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## Mixing of a two layer fluid in a Taylor-Couette flow

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In order to study diapycnal mixing by vortices and anisotropic turbulence we have investigated the evolution of a density stratified two-layer fluid in a Taylor-Couette flow. The two-layer stratification is found to initially sharpen, subsequently to bifurcate into an increasing number of layers with an approximately equal density difference, and to eventually mix over the entire fluid depth. This scenario varied slightly for the different flow-regimes ranging from vortex, wavy-vortex and turbulent flow. In particular the mixing efficiency depends on the flow regime. We explored the mixing efficiency as a function of and flux Richardson number, which appears to have a maximum near resonance where rotation and stratification frequency are approximately equal. The evolution of the active tracers is compared with the lagrangian displacement of passive tracers and the different mixing scenarios such as under the influence of wavy motions and vortices are discussed. (This work continues the unfinished work of Boris Bouvnov, who died in 1999)