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External and internal interfaces within geophysical turbulent flows

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Recent results on the sharp 'external' interfaces between high and low turbulence regions are now being applied to the study of the 'internal'thin shear layers and distorted eddies that determine the structure of high Reynolds number turbulence , as seen by conditional sampling of numerical simulations (by Kaneda and colleagues at Nagoya) and laboratory experiments (by Worth and Nichols at Cambridge). The new model explains the fast production of the 3-d quasi isotropic structure of turbulence that enables it to adjust rapidly as it is entrained into external interface layers. It also suggests when there should be differences and similarities in the temperature and velocity spectra, as observed in geophysical and laboratory flows..
In stably stratified flows internal waves are generated on the low turbulence side of these external interfaces.Although, as numerical simulations at ASU by Mahalov and Mostaoui and RDT theory have shown, these waves carry significant momentum flux, this effect is ignored in all operational weather/climate models , probably with serious implications.