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Laboratory experiments of an atmospheric/oceanic turbulence ADRIEN THACKER, OLIVIER EIFF, Institut de Mecanique des Fluides de Toulouse, WAVES, TURBULENCE, ENVIRONMENT TEAM — Atmospheric or oceanic turbulence is strongly influenced by the effects of stratification leading to the emmergence of quasi-horizontal layers often described as "pancake" structures. The mechanisms of this layering and the selection of the vertical length scale of pancake structures is discussed for one decade whereas it is of a major importance to elucidate the energetic cascade that leads to viscous dissipation. In this present work, we analyze a new series of decaying grid turbulence experiments under the effects of stratification aiming to identify and observe the strongly stratified turbulence regime. The experiments have been performed in a large water towing tank with salt stratification and measurements have been carried out using a scanning correlation imaging velocimetry technique providing instantaneous 3D3C velocity fields along the decaying turbulence. Self similar power laws of the decaying grid turbulence have been assessed and allow the definition of empirical critical time giving transitions to the strongly stratified turbulence regime. A first experimental evidence of overturning process between layers of pancake vortices has been obtained through vorticity fields observation. This observation support the existence of a downscale energy cascade.

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