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Volume Scaling of Intense Mixing Regions in Homogeneous Stratified Turbulence[1] GAVIN PORTWOOD, STEPHEN DE BRUYN KOPS, Univ of Mass - Amherst — The spontaneous generation of localized turbulent patches or bursts in otherwise homogeneous flow is a widely accepted characteristic of stratified turbulence and can occur through many mechanisms. Here, we address this spacio-temporal variability in homogeneously forced stationary turbulence across a broad Fr-Re parameter space as realized through pseudo-spectral DNS of Boussinesq turbulence. Using a conditional averaging scheme based on local density gradient inversions, a domain is objectively subdivided into 'quiescent regions', 'intermittent layers' and 'turbulent patches'. We observe that these regions may be characterized by an appropriate locally averaged $\mathrm{Gn} \equiv \epsilon/\nu \mathrm{N}^2$ in that they exhibit $\mathrm{Gn} \sim \mathrm{O}(1)$, $\mathrm{Gn} \sim \mathrm{O}(10)$, and $\mathrm{Gn} \sim \mathrm{O}(100)$, respectively. We show that even at nominal bulk Gn, the majority of mixing is confined to small and intense turbulence patches. The volume of these patches scales with the bulk $\mathrm{Gn}^{1/2}$.

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