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On The Structure And Characteristics Of Intermittent Patches In Stably Stratified Atmospheric Boundary Layers[1] ABHISHEK PARASWARAR HARIKRISHNAN, Free University of Berlin, CEDRICK ANSORGE COLLABORATION, RUPERT KLEIN TEAM, NIKKI VERCAUTEREN TEAM — We investigate the Ekman flow simulations of Ansorge (2016) which describe the Atmospheric Boundary Layer (ABL) over a smooth orography with constant geostrophic forcing. Our database is comprised of three stratified cases at different stability regimes with the bulk Richardson numbers $Ri_B = 0.26, 0.58, 0.76$ and a neutrally stratified case. Following the "Taxonomy of structures" by Robinson (1991), we study the ABL in terms of its coherent structures with numerous scalar criteria. An appropriate threshold (τ_p) is identified for each scalar criterion by determining the region of percolation transition. This transition can be seen when the threshold τ is continuously varied and the observed structure changes from being a complex connected cluster to simpler, disconnected clusters. Visualization at this threshold for a scalar criterion (say the $Q-$criterion) reveals large regions devoid of structures for all stratified cases. This has been observed to extend from the outer layer to the viscous sublayer. We also extract individual structures at τ_p and geometrically characterize them with the help of three parameters namely the Shape Index, Curvedness and Stretching. Then, we proceed to compare their shapes for all cases.

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