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**Lagrangian and Eulerian Acceleration Statistics in Turbulent Stratified Shear Flows** FRANK JACOBITZ, University of San Diego, KAI SCHNEIDER, Aix-Marseille University, MARIE FARGE, Ecole Normale Superieure — The Lagrangian and Eulerian acceleration statistics in homogeneous turbulence with shear and stratification are studied using direct numerical simulations. The Richardson number is varied from $Ri = 0$, corresponding to unstratified shear flow, to $Ri = 1$, corresponding to strongly stratified shear flow. In addition, the scale dependence of the acceleration statistics is studied using a wavelet-based approach. The probability density functions (pdfs) of both Lagrangian and Eulerian accelerations show a strong and similar influence on the Richardson number and extreme values for Eulerian acceleration are stronger than those observed for the Lagrangian acceleration. Similarly, the Eulerian time-rate of change of fluctuating density is observed to have larger extreme values than that of the Lagrangian time-rate of change. Hence, the time-rate of change of fluctuating density obtained at a fixed location by an Eulerian observer is mainly due to advection of fluctuating density through this location, while the time-rate of change of fluctuating density following a fluid particle is substantially smaller, and due to production and dissipation of fluctuating density.

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