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Density overturns and local stability measures in early stratified wakes¹ TRYSTAN MADISON, PRABU SELLAPPAN, XINJIANG XIANG, GEOFFREY SPEDDING, University of Southern California — Though the dynamics of decaying stratified turbulence are sensitive to certain details of the initial generating conditions, the late-time evolution has also general characteristics that depend only on local stratification parameters, often characterised by a buoyancy Reynolds number, $Re_b = Re.Fr^2$. Bluff-body wakes, for example, have been shown to have universal characteristics that do not depend on details of the generator. Recent experiments on the near wake of a towed grid (Xiang et al. *J. Fluid Mech.* 775, 149-177, 2015) show that the trajectory of solutions entering the late stratified turbulence regime vary significantly with both Re and Fr , reflecting different balance between wake-edge shear instabilities and local, grid turbulence-generated motions. Here we show density profiles taken through the grid wakes for $Re = 2700$ and $Fr = \{2, 4, 9\}$. The relative importance of stabilising density gradients *vs.* destabilising shear flows is customarily measured by a global and/or local Richardson number, Ri , and such measures will be compared and contrasted to form a more complete and quantitative picture of the early wake instabilities than has been available hitherto.

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