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Gravity currents in strongly stratified fluids BENJAMIN MAURER, PAUL LINDEN, DAMTP, University of Cambridge — For fluids subject to gravity, vertical density gradients are stable while horizontal density gradients often sharpen to laterally propagating fronts called gravity currents. As recent studies have shown, the energetics and therefore the dynamics of gravity currents propagating in a stratified fluid are affected by the vertical density stratification. To investigate the role of vertical stratification in the flow dynamics, we conducted an experimental and numerical study of buoyancy-driven, high *Re* lock-releases between two fluids of equal density stratification structure and strength but differing depth-averaged densities. We examined both layered and continuous vertical density stratifications, focusing on the cases where the vertical density gradients are strong relative to the horizontal mean density difference. Lock-releases between discretely layered fluids of unequal depth-averaged densities result in multiple interleaving flows advected by a less energetic full-depth flow. Lock-releases between linearly stratified fluids of unequal depth-averaged densities result in a full-depth flow similar to the less energetic flow in the discretely layered case. We present dimensional analysis and energy scaling models describing the relevant length scales and buoyancy forcing

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