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Entrainment of low Mach number thermals in stratified atmospheres

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ABSTRACT

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We perform direct numerical simulations of the evolution of dry thermals by solving the fully compressible Navier-Stokes equations,

$$\frac{D\ln\rho}{Dt} = -\nabla\cdot(\boldsymbol{u}) \tag{1}$$

$$\frac{D\boldsymbol{u}}{Dt} = -\frac{1}{\rho}\nabla P + \boldsymbol{g} + \nabla\cdot\left(\bar{\bar{\boldsymbol{\Pi}}}\right), \tag{2}$$

$$\frac{DT}{Dt} + (\gamma-1)T\nabla\cdot(\boldsymbol{u}) + \frac{1}{\rho c_V}\nabla\cdot(-\rho\chi\nabla T) = \frac{1}{\rho c_V}(\bar{\bar{\boldsymbol{\Pi}}}\cdot\nabla)\cdot\boldsymbol{u}, \tag{3}$$

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APPENDIX

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