Convective heat transport in stratified atmospheres at low and high Mach number

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Abstract goes here

INTRODUCTION

Blah blah relevant background and other stuff

EXPERIMENT

Here's a polytrope:

$$\begin{aligned} \rho_0(z) &= \rho_t(1 + L_z - z)^m, \\ T_0(z) &= T_t(1 + L_z - z), \end{aligned} \tag{1}$$

We evolve the Fully Compressible Navier-Stokes equations,

$$\frac{\partial \ln\rho}{\partial t} + \nabla\cdot\boldsymbol{u} = -\boldsymbol{u}\cdot\nabla\ln\rho, \tag{2}$$

$$\begin{aligned} \frac{\partial \boldsymbol{u}}{\partial t} + 2\boldsymbol{\Omega}\times\boldsymbol{u} + \nabla T - \nu\nabla\cdot\bar{\bar{\boldsymbol{\sigma}}} - \bar{\bar{\boldsymbol{\sigma}}}\cdot\nabla\nu = \\ -\boldsymbol{u}\cdot\nabla\boldsymbol{u} - T\nabla\ln\rho + \boldsymbol{g} + \nu\bar{\bar{\boldsymbol{\sigma}}}\cdot\nabla\ln\rho, \end{aligned} \tag{3}$$

$$\begin{aligned} \frac{\partial T}{\partial t} - \frac{1}{c_V}\left(\chi\,\nabla^2 T + \nabla T\cdot\nabla\chi\right) = \\ -\boldsymbol{u}\cdot\nabla T - (\gamma-1)T\nabla\cdot\boldsymbol{u} \\ + \frac{1}{c_V}\left(\chi\nabla T\cdot\nabla\ln\rho + \nu\left[\bar{\bar{\boldsymbol{\sigma}}}\cdot\nabla\right]\cdot\boldsymbol{u}\right), \end{aligned} \tag{4}$$

with the viscous stress tensor given by

$$\sigma_{ij} \equiv \left(\frac{\partial u_i}{\partial x_j} + \frac{\partial u_j}{\partial x_i} - \frac{2}{3}\delta_{ij}\nabla\cdot\boldsymbol{u}\right). \tag{5}$$

RESULTS & DISCUSSION

This is where figures go and other important things that we like to talk about.

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