Abstract Submitted
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Radiative damping of convectively-driven gravity waves in the atmospheres of hot Jupiters[1] JHETT BORDWELL, BENJAMIN BROWN, University of Colorado Boulder, JEFFREY OISHI, Bates College, WHITNEY POWERS, University of Colorado Boulder — Jovian atmospheres consist of a substantial, deep convection zone underlying a stably stratified region populated by convectively driven waves at many scales. These waves are significant to the pumping of large scale atmospheric jets, upper atmosphere heating, and chemical transport. To understand the role that radiation plays in the propagation of these waves, we perform numerical experiments with Dedalus at small scales studying wave driving and chemical transport in an atmosphere with radiative diffusion (appropriate for a hot Jupiter). We find that assuming an opacity structure appropriate for a Jovian atmosphere, all but the largest scale waves are damped out by radiation. We further compare our results with those of a Reynold's stress forcing model of wave driving, and explore the transport of reactive passive tracers through a simple Newtonian relaxation model.

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