



EFFECTS OF A STOCHASTIC GRAVITY WAVE SCHEME ON THE SIMULATED TROPICAL STRATOSPHERE

C. Piani

University of Oxford (cpiani@atm.ox.ac.uk ; Tel.: +44 1865 272 931; Fax.: +44 1865 272 923)

Deterministic parametrization schemes have so far been undoubtedly successful in representing subgrid-scale (unresolved) motions in global climate prediction models. However these types of parametrizations intrinsically neglect subgrid-scale variability and it has been recently shown that this can lead to large errors in the resolved climate. This suggests that stochastic parametrizations, which do not neglect unresolved variability, may in some cases improve climate simulations.

Convection is thought to be the most important source of gravity waves in the tropics. Unfortunately convectively triggered gravity waves are episodic in nature and highly variable in strength. Finally the circulation of the tropical stratosphere is strongly affected by wave-mean flow interactions. It therefore seems reasonable to study the effects on the tropical stratospheric climate of a stochastic gravity wave scheme. A version of the Hines gravity wave scheme with a stochastic source strength is developed. The scheme is implemented in the Unified Model in the hope of improving the simulated equatorial stratosphere. The focus is on both the quasi biennial oscillation and on the annual cycle.