Geophysical Research Abstracts, Vol. 9, 06451, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-06451

Parameterization of convective boundary layers using mass-flux scheme

J. Pergaud (1), V. Masson (1) and S. Malardel(1)
(1) Meteo France/CNRM/GMME (contact Email: julien.pergaud@cnrm.meteo.fr)

For deep convection resolving models, the largest convective ascents which may be at the origining of cumulus clouds are subgrid processes which need to be parameterized. The mass flux formulation of the convective mixing is now largely accepted as an efficient approach to parametrise the contribution of larger vortivies and plumes in convective dry and cloudy boundary layers for Numerical Weather Prediction models. Following the work of Soares et al (2004), an improved formulation of a single idealized updraft was developed. The entrainment and detrainment of conservative thermodynamics variables in the ‘‘dry” boundary layer of the updraft are computed as an inverse function of down/up mixing lengths . If a lifting condensation level (LCL) is reached, this single updraft continues in the cloud, but entrainment/detrainment above the LCL are then computed by a parcel buoyancy sorting formulation. This mass-flux approach has been developped to compute second-order moments like in a convection scheme added to a turbulence scheme or to compute third-order moments directly added in the turbulence scheme. This new set of parametrisation has been tested in the single column version of the model on classical shallow convection case (Bomex, Eurocs/ARM/Cu, Rico) but also in typical dry convective case (Ayotte, Wangara). Results will be presented like scheme description.