

# The parameterisation of cumulus cloud amounts

## Abstract

Cumulus are ubiquitous over the tropical ocean and mid-latitude summer time boundary layer. They impact the thermodynamic structure of the lower atmosphere and, through interaction with the solar radiation, influence the surface energy budget.

In this work, we implement a physically based parameterization of cumulus cloud fraction and couple this with the Bechtold-Kain-Fritsch convection scheme. A Single Column Model is used to evaluate the performance of this package for the GCSS/EUROCS cumulus diurnal cycle case. The scheme is implemented into the 3D Canadian Regional Climate Model (CRCM) and the representation of cumulus convection and associated cloud fields is evaluated over the tropical Pacific following the Pacific Cross-Section Intercomparison (GPCI) experiment protocol. Subsequent to this analysis, CRCM integrations will be performed over North America to assess the impact of the improved cumulus cloud fraction parameterization on the surface radiation budget.