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What can we learn from CRMs? Lessons from EUROCS

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EUROCS brought together in Europe Union a critical mass of the scientific community working in various areas but with a same goal: to improve cloud system representation in Weather and Climate Models (hereafter WCM). The main strategy was based on model hierarchy (from 1D column model to CRM and full large scale model) & observations. The addressed issues were chosen by European large scale modelling groups: Diurnal cycle of marine stratocumulus, continental cumulus and precipitating convection , Sensitivity to mid-troposphere humidity of cloud development. Complementary to the 4 case studies, comparisons between WCM and observations were performed through a pacific cross-section sampling all types of clouds.

EUROCS allowed to bring more theoretical and physical insights in the evaluation and improvement of cloud schemes (Focus on processes). Physically-grounded corrections of current schemes were designed and tested. Works are going on in using the case studies designed during the project. Many results were obtained (more information on results can be found in the special EUROCS issue of QJRMS (October 2004 Part C) and on http://www.cnrm.meteo.fr/gcss/EUROCS/EUROCS.html)

In despite of EUROCS success, implementation in WCMs of parameterization improved during EUROCS did not sytematically and directly lead to better results in WCM simulations. Main reasons include: Compensating errors; Framework of case study too limited; Too few tests on free parameters of each case study; Tests of only parts of physical package (no all internal feedbacks); No dynamical feedbacks not allowed. Moreover the project funding ends up after 3 years, a too short period to resolve all problems to be faced in cloud representation in WCMs.

To overcome the methodlogical difficulties, possible strategies for future will be given.