Global cloud resolving simulations using the Earth Simulator - New era of atmospheric modeling

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Most of current atmospheric general circulation models (AGCMs) employ a cumulus parameterization to represent effect of sub-grid scale cloud convection. The cumulus parameterization, however, is widely known as one of the most uncertain components in AGCMs, since its formulation is based on an idealized statistical assumption. In order to avoid this ambiguity, we directly resolve cumulus convections in an AGCM named NICAM (Nonhydrostatic ICosahedral Atmospheric Model), which is effective for calculation with horizontally high resolution. In this cloud resolving model, the multi-scale and multi-physical interactions are treated explicitly. On 2004, we have performed global cloud-resolving simulations with horizontal grid intervals dx = 14km, 7km and 3.5km on an aqua planet setup (Tomita et al. 2005). We are now performing on CFMIP-like condition with topography, and we will show the first results at the meeting.