Study for Prediction of Local Heavy Rainfall and the Next Generation Super Computer Program

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Although the QPF performance of the operational mesoscale NWP has been improving in recent years, prediction of the local heavy rainfall is still difficult, especially for those which occur in the unstable atmospheric condition without synoptic or orographic forcing. Such the events are practically unpredictable in the current NWP due to the difficulty to prepare proper initial conditions corresponding with the smallness of their spatial and temporary scales, and the instinct low predictability of unforced deep convection. To overcome above problems, several studies have been conducted at MRI collaborating with the Numerical Prediction Division of JMA; development of a cloud resolving 4D-VAR system [1], assimilation experiments of GPS data for heavy rainfall cases [2,3], participation in the WWRP Beijing Olympic 2008 RDP mesoscale ensemble prediction system intercomparisons including application of the Meso 4D-VAR to the Beijing area [4,5]. Toward the dynamical and probabilistic forecasts of heavy rainfalls, a plan of super high performance NWP with the cloud resolving ensemble data assimilation using a next generation super computer has been proposed. A field campaign in the Tokyo metropolitan area is also planned as a testbed of a dense observation network for deep convection.

Keywords: local heavy rainfall, data assimilation, mesoscale ensemble prediction

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