

## Visualization of the Cloud Simulation with Super-droplet Method

# Shintaro Kawahara[1]; Fumiaki Araki[1]; Shin-ichiro Shima[1]; Kanya Kusano[1]

[1] ESC/JAMSTEC

<http://www.es.jamstec.go.jp>

Large-scale and high-precision simulations about various natural phenomena and engineering systems become realized by using the earth simulator, which is one of the world most powerful super-computer. However, many of the complex phenomena are composed of multiple hierarchies of different scales and various physical processes. It is a challenging work to achieve the simulation including all the processes. Thus, we are developing a new algorithm, which can describe the interaction of multi-scale processes in terms of the combination of different simulation models. Cloud formation and precipitations are included in such the typical multi-scale and multi-physics phenomena. The interaction between the two different processes, cloud hydrodynamics and cloud microphysics, must be well taken into account to simulate accurately.

We have recently developed the new cloud model by introducing the new concept called super-droplets, and successfully simulated the cloud formation process. In this paper, we have tried to visualize the cloud formation and rainfall process, by using the information of ten-millions of super-droplets calculated in the simulation. We will explain the method to visualize all of the cumulus cloud based on the size distribution, flow conditions and optical properties of water droplets. We will also show the visualization results of the new cloud simulation.