

Development of Neural Network Tomography for Water Vapor Distribution

Akimitsu Hiroki¹, Shinji Hirooka¹, Katsumi Hattori^{1*}

¹Graduate School of Science, Chiba University

Many meteorological disasters such as flood and landslide with torrential rain have been reported, and the mechanism of the precipitation system has been studied. Grasp of the situation of the local precipitation is important and the portable radar is one of the advanced tools. Practical studies based on the radar are now going on. However, in the developing countries such as Indonesia and Philippines, the observation with the radars has difficulties due to the cost and the maintenance. The water vapor tomography using a GPS and/or broadband satellite is thought to be effective as a situation of the precipitation monitoring system in above-mentioned countries. When the development of a rain cloud to bring the disasters, there is an inflow of the water vapor from the neighborhood. Therefore, we try to develop water vapor tomography, which provides the three-dimensional water vapor distribution, from GPS data and AMeDAS using algorithm of residual minimization learning neural network (RMTNN). The numerical simulation demonstrates that three-dimensional water vapor distribution can be estimated from GPS data. The details will be shown at our presentation.

Keywords: water vapor tomography, GPS