An intense arctic cyclone in August 2012: A Transition Mechanism to Arctic Cyclone

Takuro Aizawa¹*, Hiroshi L. TANAKA²

¹Life and Environmental Sciences, University of Tsukuba, ²Center for Computational Sciences, University of Tsukuba

An intense arctic cyclone in August 2012 is investigated in this study. Especially, we analyzed i) three dimensional structures and ii) mechanisms of the development focused on a transition process to arctic cyclone from extratropical cyclone.

The center pressure of the arctic cyclone decreases to 965 hPa, which is an all-time minimum in August arctic cyclones. In the early phase, the arctic cyclone is a shallow baroclinic cyclone originated with an arctic front of 60 degree north. Then the baroclinic cyclone undergoes the transition process of the arctic cyclone due to the merger with a relatively weak (990 hPa) preceding arctic cyclone. The shallow baroclinic cyclone becomes a deeper and wider barotropic cyclone with a couple of stratospheric warm core and tropospheric cold core. Analyses show that the transition to arctic cyclone plays some important role in the development of the arctic cyclone.

Keywords: arctic cyclone, extratropical cyclone, transition process