



## **Response of Tropical Cyclone Tracks to Sea Surface Temperature in the Western North Pacific**

Masaru Inatsu and Kotaro Katsube

Hokkaido University, Sapporo, Japan (inaz@mail.sci.hokudai.ac.jp)

A set of short-term experiments using a regional atmospheric model (RAM) were carried out to investigate the response of tropical cyclone (TC) tracks to sea surface temperature (SST) in the western North Pacific. For ten selected TC cases occurring during 2002-2007, a warm and a cold run are performed with 2 K and  $-2$  K added to the SSTs uniformly over the model domain, respectively. The cases can be classified into three groups in terms of recurvature: recurved tracks in the warm and cold runs, a recurved track in the warm run and a non-recurved track in the cold run, and non-recurved tracks in both runs. Commonly the warm run produced northward movement of the TC faster than the cold run. The rapid northward migration can be mainly explained by the result that cyclonic circulation to the west of the TC is found in the steering flow in the warm run and it is not in the cold run. The beta effect is also activated under the warm SST environment. For the typical TC cases, a linear baroclinic model experiment is performed to examine how the cyclonic circulation is intensified in the warm run. The stationary linear response to diabatic heating obtained from the RAM experiment reveals that the intensified TC by the warm SST excites the cyclonic circulation in the lower troposphere to the west of the forcing position. The vorticity and thermodynamic equation analysis shows the detailed mechanism. The time scale of the linear response and the teleconnection are also discussed.