**Institute of Atmospheric Physics, National Central University**

Date: 2018/04/20

Location : S1-713

Speaker : Dao Thi Lan

Advisor : Prof.Jia-Yuh Yu

**Present Simulation and Future Typhoon Activity Projection over Western North Pacific and Taiwan/East Coast of China in 20-km HiRAM Climate Model**

**Abstract**

The potential changes in typhoon activity under global warming is an interesting scientific issue, and it has been investigated by many studies. However, the future TC projections in individual basins are difficult and uncertain. On the purpose of investigating how and why TC changes occur over the western North Pacific (WNP) and Taiwan/ East Coast of China (TWCN), this study used the High Resolution Atmospheric Model (HiRAM) at 20-km resolution to simulate tropical storm activity over these regions at the present time (1979-2003) and future time (2075 -2099) under the Intergovernmental Panel on Climate Change (IPCC) fifth assessment report (AR5) representative concentration pathway (RCP) 8.5 scenarios. The results show that the climatology mean TS genesis frequency, TS track over the WNP and TWCN region are well simulated by HiRAM at 20-km resolution. However, HiRAM overestimated the number of weak TSs and seriously underestimated the number of intense TSs over the WNP region. The linkage between large-scale environments and TS genesis simulated by HiRAM are greatly superior to those in low-resolution fifth Coupled Model Intercomparison Project (CMIP5) models. The TS numbers over the WNP and TWCN are projected to decrease during 2075-2099, which is consistent with the IPCC AR5 report. However, the rate of change (-49%) is much greater than that predicted in IPCC AR5. The decrease of TS genesis numbers in the future is primarily attributed to the reduction in mid-level relative humidity and large-scale ascending motion, although the warmer sea surface temperature (SST), the reduced vertical wind shear provide more favorable conditions for TS formation. TS intensity and the maximum precipitation rates are projected to increase under global warming. At the end of the 21st century, the mean precipitation rate within 200 km of the storm center over the WNP and TWCN region are projected to increase by 22%, 54%, respectively.

**Key word**:

Tropical Storm

**Reference:**

Tsou, C. H., P. Y. Huang, C. Y. Tu, C. T. Chen, T. P. Tzeng, and C. T. Cheng, 2016: Present simulation and future typhoon activity projection over western North Pacific and Taiwan/East Coast of China in 20-km HiRAM climate model. *Terr. Atmos. Ocean*., **27**, 687-703.