

Unexpected high contribution of in-cloud wet scavenging to nitrogen deposition induced by pumping effect of typhoon landfall in China

BAOZHU GE

Institute of Atmospheric Physics

Presenting Author: gebz@mail.iap.ac.cn

Atmospheric nitrogen deposition has large eco-environmental effects in coastal areas. However, knowledge of the source and the pathway of N deposition in coastal areas is limited, especially during tropical storms, hindering the accurate quantification of how anthropogenic activities influence the ocean ecosystem. In this study, the Nested Air Quality Prediction Modeling System was used to investigate the wet deposition of N induced by typhoon Hagupit over eastern coastal China from an in- and below-cloud process perspective. Our results reveal for the first time an enhancement mechanism of N deposition related to the ‘pumping effect’ of the typhoon. Different from the non-typhoon conditions, air pollutants in the typhoon-affected regions were pumped into the higher altitudes and deposited via the in-cloud scavenging process in the moving path of the typhoon-affected regions. This study updates our understanding of the source–receptor relationship on atmospheric wet deposition caused by tropical cyclones.

