



國立中央大學太空科學與工程學系  
*Department of Space Science and Engineering,  
National Central University*

## 專題演講

# Effects of convection on the composition and circulation of the lower stratosphere

Speaker : **Dr. Kai-Wei Chang**

Department of Atmospheric Sciences, Texas A&M  
University

Time : 111 年 3 月 22 日 星期二 14:00-15:00

Place : 健雄館(科四館) S4-917 教室

摘要/Abstract :

Convective storms not only modulate the tropospheric circulation but also exert a strong influence on the chemical composition and the circulation in the lower stratosphere. Storms that are especially strong can overshoot the tropopause and inject chemical species of tropospheric origin into the stratosphere. Aside from directly transporting air into the stratosphere, convection can also modulate circulation in the lower stratosphere through forced planetary waves. This talk gives an overview on the impacts of convection on the stratosphere, with a focus on the North American region. Preliminary results of the NASA Dynamics and Chemistry of the Summer Stratosphere (DCOTSS) campaign show the strong hydrating effect of tropopause-overshooting convection (OC) on the lower stratosphere; we directly sampled convectively-influenced air with water vapor mixing ratio up to 7x the stratospheric background. Analysis based on weather radar data and air trajectory modeling suggests that almost half (45%) of air plumes originating from OC events remain in the stratosphere after thirty days, demonstrating the importance of OC over the U.S. on the global stratosphere.

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