## 國立中央大學大氣物理研究所書報討論

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## The impact of AHI data assimilation in TAHOPE IOP5 thunderstorm case

## Abstract

Data assimilation aims to improve the initial field. The information about moisture in the preconvection environment is crucial, especially for severe weather events. However, surface stations lack detailed information on moisture profiles. Because of this limitation, the Advanced Himawari Imager (AHI), onboard Himawari 8, becomes essential as it offers vertical profiles of moisture and temperature data.

Previous studies on thunderstorms and typhoons have shown significant improvement in rainfall forecasts and track predictions through the assimilation of AHI data. Therefore, for the TAHOPE experiment, we chose to investigate a thunderstorm case. By assimilating AHI radiation data, we aim to focus on its impact on heavy precipitation events.

Results indicate that assimilating AHI data affects middle or high-level moisture and temperature fields, thereby improving the accuracy of rainfall forecasts. AHI data with Global Telecommunication System (GTS) and surface observations improved skill scores for 12-hour accumulated rainfall predictions compared to assimilating only GTS and surface data. Further sensitivity testing involved filtering out data from the eastern and western regions of AHI data. It was observed that assimilating data from the eastern sea of Taiwan notably influenced the observed rainfall pattern.

## Keywords

Brightness Temperature (BT)