

# 國立中央大學大氣物理研究所書報討論

Date: 2026/03/06

Location: S1-713

Speaker: Chih-Liang Ho

Advisor: Prof. Kao-Shen Chung

## **Impacts of Initial Condition Perturbation Blending in 10- and 40-Member Convection-Allowing Ensemble Forecasts**

### **Abstract**

Convection-allowing 36-h ensemble forecasts from the 2018 spring season are used to assess the effects of ensemble configuration and initial condition (IC) perturbation blending. Ten- and forty-member ensembles are initialized using multiscale IC perturbations produced by convective-scale data assimilation (MULTI) and by blended IC perturbations that combine MULTI with perturbations downscaled from coarser-resolution ensembles (BLEND). For both precipitation and non-precipitation variables, forecast performance is consistently improved with the larger ensemble size. The benefit of the larger ensemble mainly comes from compensating for underdispersion in the fixed-physics ensemble configuration, though not entirely. A consistent improvement in precipitation forecast skill results from blending in the 10-member ensemble configuration, corresponding to a reduction in the ensemble calibration error (i.e., reliability component of Brier score). In the 40-member configuration, the benefit of blending is evident for weak synoptic-scale forcing cases at 18–22-h and for strong synoptic-scale forcing cases at lead times beyond ~30-h. The effects of blending and ensemble configuration on non-precipitation forecasts are generally consistent with those on precipitation forecasts.

### **Keywords**

Ensemble

### **Reference**

Aaron Johnson and Xuguang Wang, 2024: Impacts of Initial Condition Perturbation Blending in 10- and 40-Member Convection-Allowing Ensemble Forecasts. *Monthly Weather Review*, **152**(6), 1421–1441, <https://doi.org/10.1175/MWR-D-23-0188.1>