**國立中央大學大氣物理研究所書報討論**

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**Improve lagrangian extrapolation of radar echoes by blending horizontal wind of numerical model: statistical performance of 16 typhoon cases**

**Abstract**

In this study, by using composite radar data from Central Weather Bureau (CWB), 16 typhoons are collected to examine the statistical performance of the McGill Algorithm for Precipitation nowcasting using Lagrangian Extrapolation (MAPLE) over Taiwan. In addition, in order to improve the nowcasting system, the information of the numerical model is blended into the system. In order to examine the performance of the nowcasting, continuous and categorical verification is used. However, the grid-point verification is strict for high resolution and could underestimate the ability of the model. Therefore, the neighborhood method is also used to verify.

First, compared to the rainfall amount from the gauges, the best Z-R relationship is determined to the following tests. Second, the statistical results of the radar echo extrapolation for 16 typhoon cases show that the quantitative precipitation nowcasting could last for up to 2 hours. However, the significant distortion for the rotation system also illustrates after 2 hours. Therefore, including the information of the numerical model is found to help to capture and maintain the rotation of typhoon rain-band structures. Furthermore, whether at the aspect of categorical verification or neighborhood method, in general, the hybrid scheme of the system further improves the nowcasting for up to 3 hours. Although the hybrid system cannot reduce the uncertainty of the displacement, it still can predict the mechanism of decay and growth. This is the reason the forecasting ability decreases as time goes.

**Keyword**

Nowcasting