

# 以微基因演算法推估系集陣風於機場測站之校驗評估 Evaluation of the calibrated wind gust estimation at airport stations using micro-genetic algorithm

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## 摘 要

為提供強風預警、減少強風災害及增進飛航安全，本研究使用中央氣象署區域系集預報系統(WRF Ensemble Prediction System, WEPS)之地面風速預報及民航局測站之觀測陣風，結合微基因演算法(Micro-genetic Algorithm, MGA)提供民航局所屬測站之陣風預報產品並進行校驗評估。根據Yang and Tsai (2019)之研究，以數值模式之10米風速與測站點之10分鐘最大陣風，透過微基因演算法滾動式更新模式10米風速與測站陣風之相關，並將此相關套用至模式10米風速之有效預報時間獲得陣風預報產品。將以中央氣象署發布之一場強風特報（陣風達8級以上）及丹納絲颱風（2025）個案進行校驗評估。

關鍵字：系集預報、陣風

## Abstract

In order to provide strong gust warnings, mitigate strong wind disasters and improve flight safety, this study uses the surface wind speed forecast of the WRF Ensemble Prediction System (WEPS) of the Central Weather Administration (CWA) and the observed gusts at the Civil Aviation Administration's stations, combined with the Micro-genetic Algorithm (MGA) to provide gust forecast products. According to the research of Yang and Tsai (2019), the correlation between the 10-meter wind speed of the numerical model and the 10-minute maximum gust of the station is successively updated by the MGA in a rolling manner, and this correlation is applied to the valid surface wind speed forecast data to obtain the gust forecast product. The verification and assessment will be conducted based on a strong wind special report (Beaufort scale reaching level 8 or above) issued by the CWA and the case of Typhoon Danas (2025).

Keywords : Ensemble prediction, gust