WISSDOM三維風場資料同化之研究
Research of Data Assimilation Using WISSDOM data

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摘　要

多都卜勒雷達風場合成方法(WInd Synthesis System using DOppler Measurements, 簡稱WISSDOM)為中央大學廖宇慶教授發展的三維風場反演技術，該方法利用多顆都卜勒雷達觀測之徑向風速，以及數值模式提供之背景場，透過使代價函數最小化的過程求得一組最佳空間三維風場。本中心與廖老師合作於2020年將WISSDOM方法作業化，整合全台共10顆作業化氣象雷達資料，每30分鐘反演一組高解析度之全台三維風場資料。本研究目的為利用雷達資料同化產生的模式風場提供給WISSDOM做為初始背景場，再將經過WISSDOM計算後的三維風場，以探空觀測(sounding)的方式再提供給雷達資料同化，當成觀測資料同化進模式中，如此進行數次的迭代後，期望改進雷達資料同化結果以得到較佳的模式初始場，進而改進定量降雨預報結果。

關鍵字：WISSDOM風場,雷達資料同化

Abstract

WInd Synthesis System using DOppler Measurements, WISSDOM, is a three-dimensional wind retrieval method developed by Prof. Liou in National Central University. It uses multi-Doppler radar radial wind observation and a background field generated by a numerical model through minimizing cost function to obtain an optimal spatial three-dimensional wind field. NCDR has cooperated with Prof. Liou since 2020, and uses 10 weather radars in Taiwan to generate three-dimensional wind field every 30 minutes. This research further uses WISSDOM retrieved 3D wind as sounding data to assimilate in WRF 3DVAR system. It is expected to obtain better model initial field and then could improve short term quantitative precipitation forecast after several times of iteration.

Key words: WISSDOM, radar data assimilation