

中央氣象局FV3GFS全球模式之研發與測試評估

Model development for CWB FV3GFS

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摘 要

中央氣象局已於近年完成新一代有限體積法立方網格全球預報系統 (Finite-Volume Cubed-Sphere Global Forecast System; FV3GFS) 之建置，將作為下一代全球數值天氣預報作業模式。目前模式水平解析度為C384T (約25公里)，並於臺灣區域設置解析度約為4.8公里之巢狀網格。為提供中央氣象局更好之全球作業模式，近期針對預報誤差進行模式物理之研發與改進。其中包括地表參數中地表利用型態、土壤型態以及植物覆蓋率之更新，修改NSAS積雲參數化方案之物理參數化過程，調整GFDL雲微物理參數化中雲冰終端速度與雲冰有效半徑的計算方式，以及修正重力波拖曳參數化中山脈阻擋的計算。於此同時亦為將來中央氣象局新一代超級電腦之購置，初步進行提高解析度至C768T (約13公里) 之測試。另一方面，亦與本局WRF團隊合作，測試CWB FV3GFS作為模式初始與邊界場對WRF模式之預報評估。以上研發內容與測試評估結果將於研討會中詳細說明。

關鍵字: CWB FV3GFS、全球模式、模式物理

Abstract

Finite-Volume Cubed-Sphere Global Forecast System (FV3GFS) has been implemented in Central Weather Bureau (CWB) with a C384T (25-km resolution) global domain and a high-resolution (4.8-km resolution) nested domain in the past few years. In order to provide a new generation and advanced global operational model at CWB, a number of developments are still performed on the model physics. The physics improvements include the surface process of land-use type, soil texture and vegetation cover fraction, the modification on the convective processes of NSAS cumulus parameterization scheme, updated GFDL microphysics scheme for decreasing ice fall speed and computing ice cloud effective radius and revised the mountain blocking in the gravity wave drag scheme. Meanwhile, C768T resolution (about 13 km) has been preliminary tested for the new computational resource. On the other hand, the global analysis and forecasts can be served as initial and boundary conditions for CWB WRF regional model. The higher temporal and spatial resolutions initial and boundary conditions are able to obtain from CWB FV3GFS directly. More detailed development and evaluation of CWB FV3GFS will be presented in the conference.

Keywords: CWB FV3GFS, global model, model physics