

「臺灣長期氣候資料整集分析」計畫研究(4)

探討NWP資料 對檢測氣溫觀測合理性的可應用性

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大綱

- 研究動機
- NWP資料應用—MOS
- NWP資料應用—Smart Init
- 研究設計
- 資料與研究區域
- 分析討論
 - 月份分析結果
 - 小時分析結果
 - 單一測站結果
- 結論

研究動機

- 利用NWP資料作為觀測資料檢核使用
- NWP資料直接使用?降尺度
- NPW資料降尺度直接使用?資料再處理

MOS降尺度方法

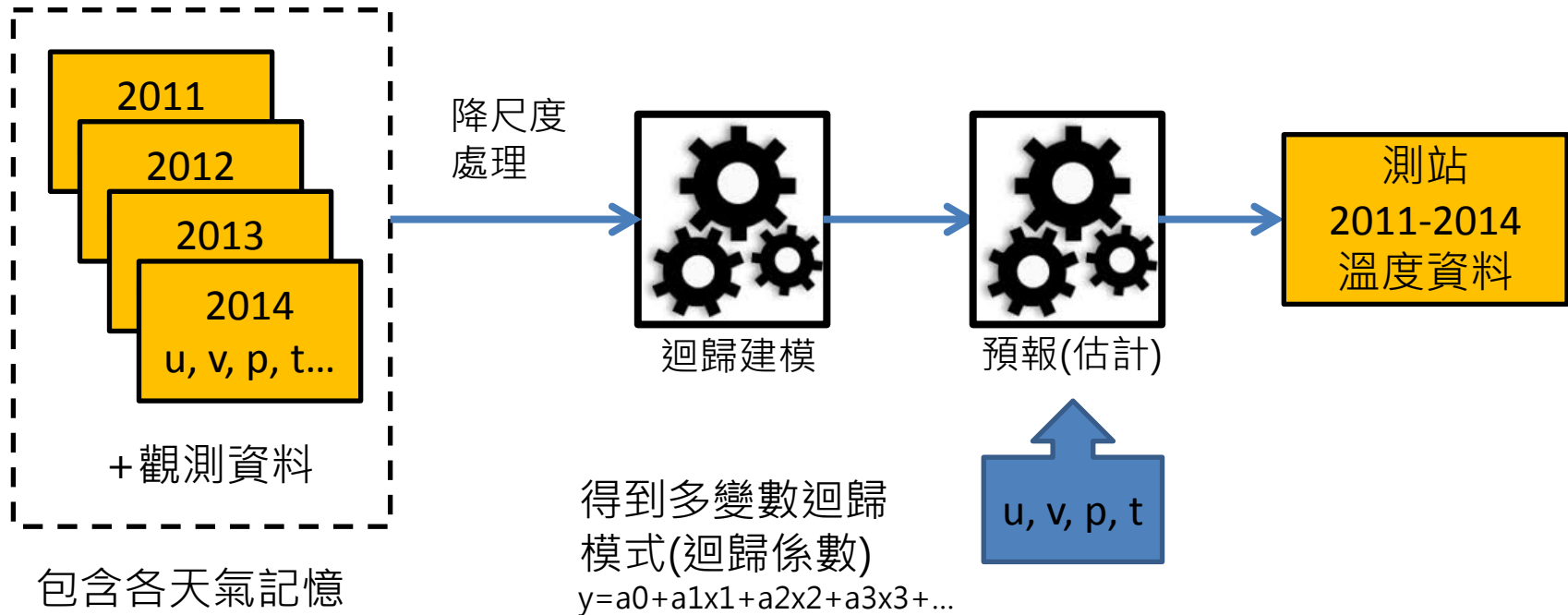
Smart Init降尺度方法

NWP資料應用—MOS

(Model Output Statistics)

統計方法

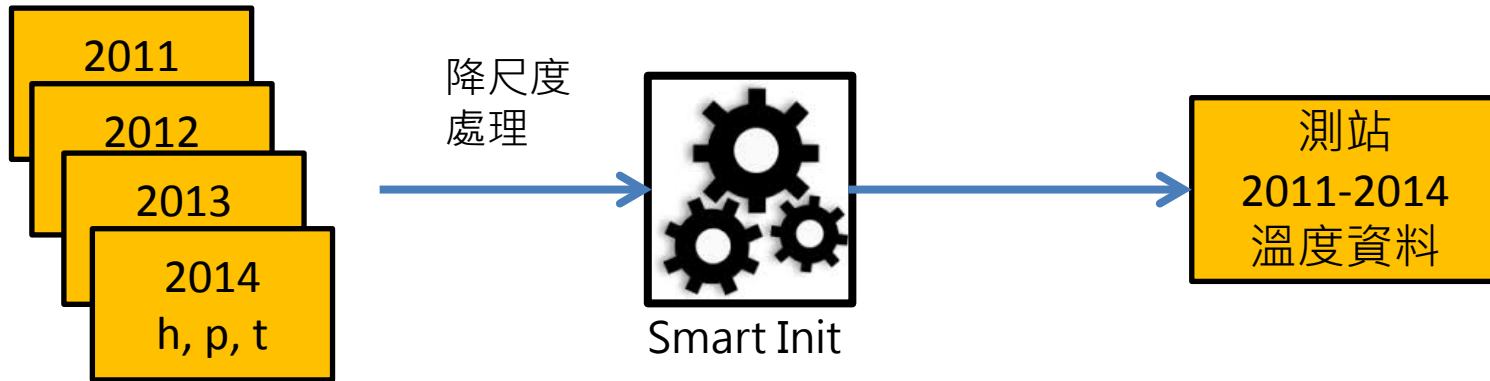
利用數值模式產品，選定一段時間多種氣象變數經由複迴歸 (multivariate regression) 建立模型係數，再經計算得到預報結果



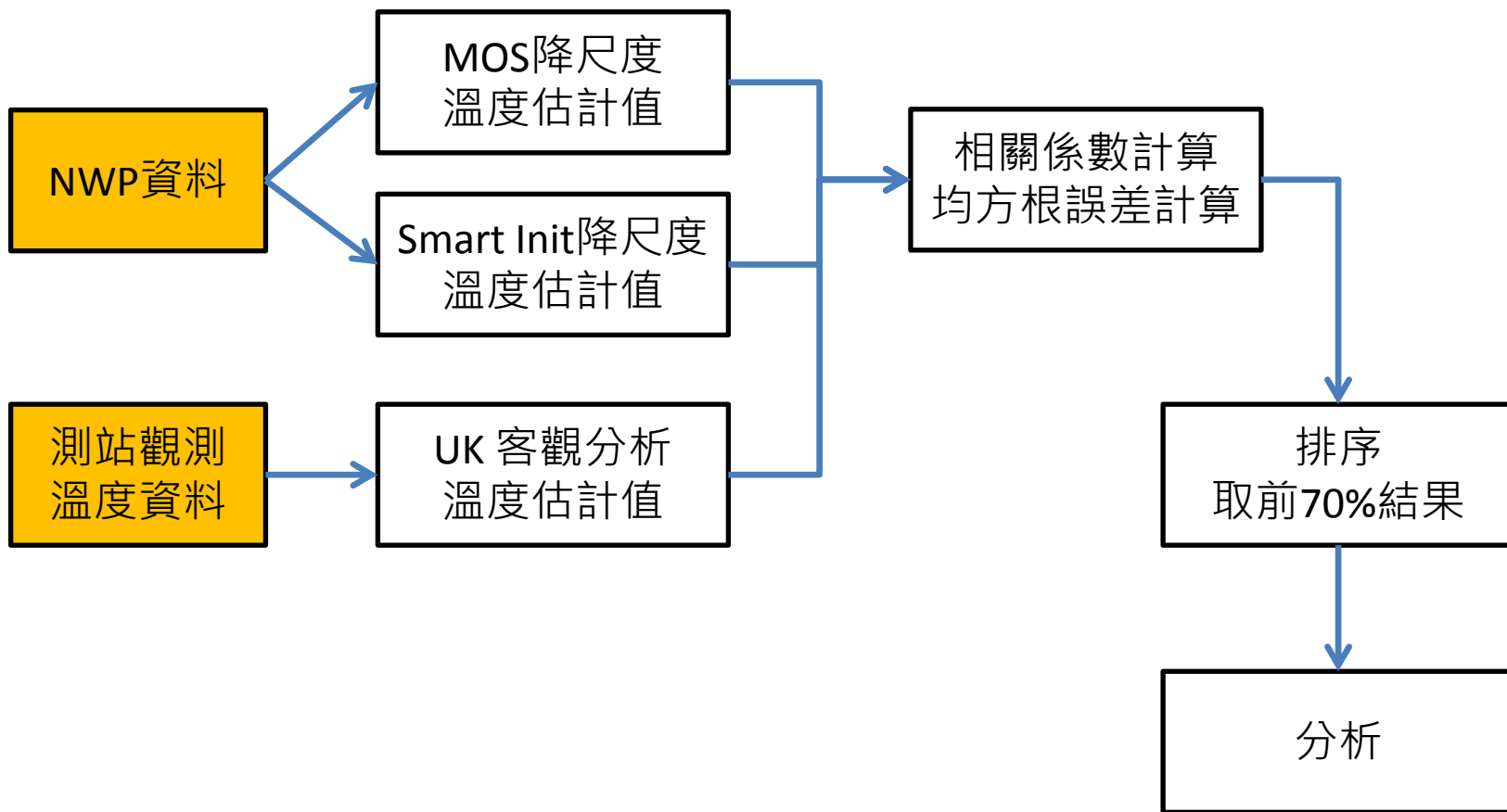
NWP資料應用—Smart Init

物理方法

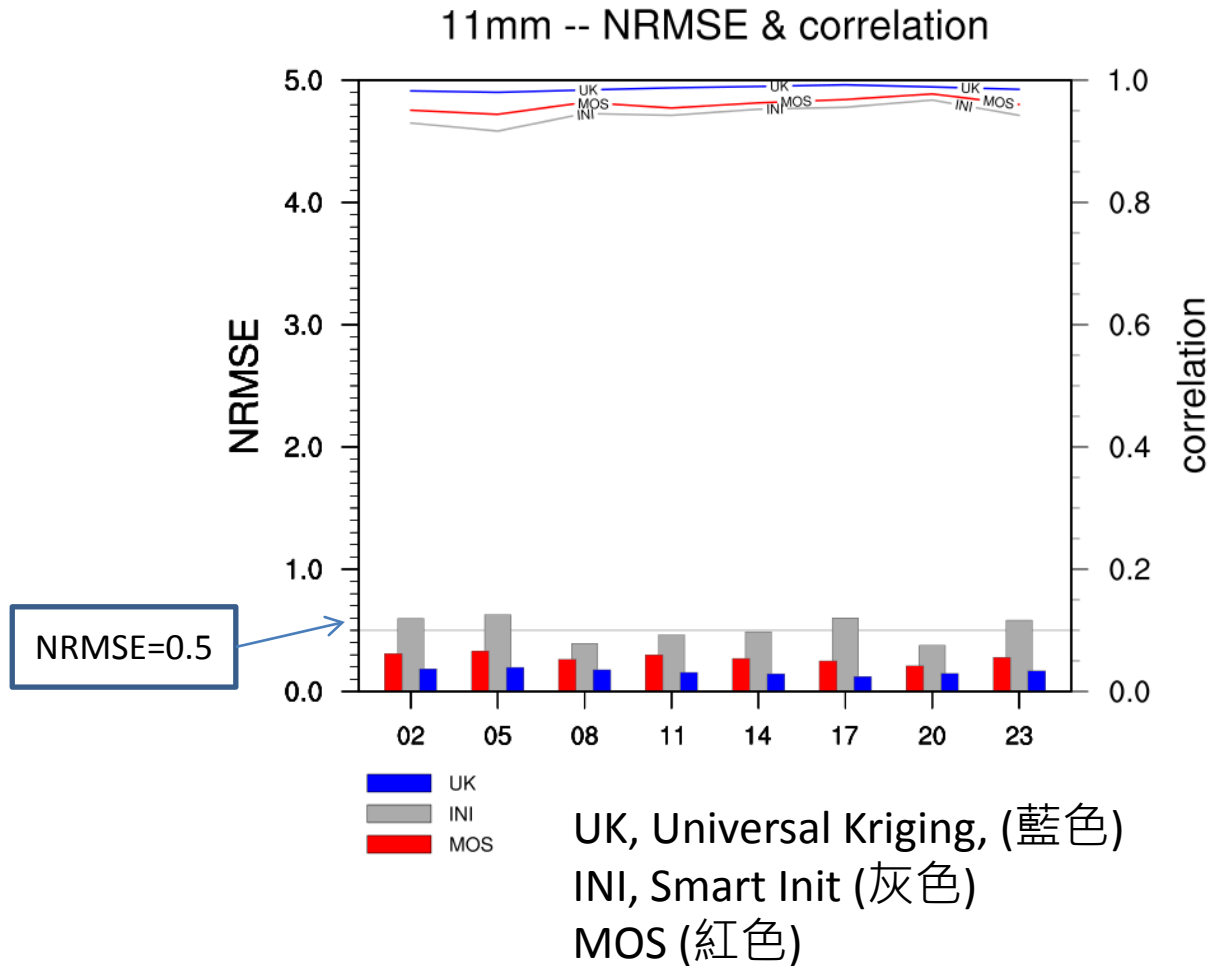
利用數值模式產品(溫度、重力位高度)和測站地形資料，透過溫度遞減率的計算，將預報資料轉換為比較合乎實際狀況的結果



研究設計

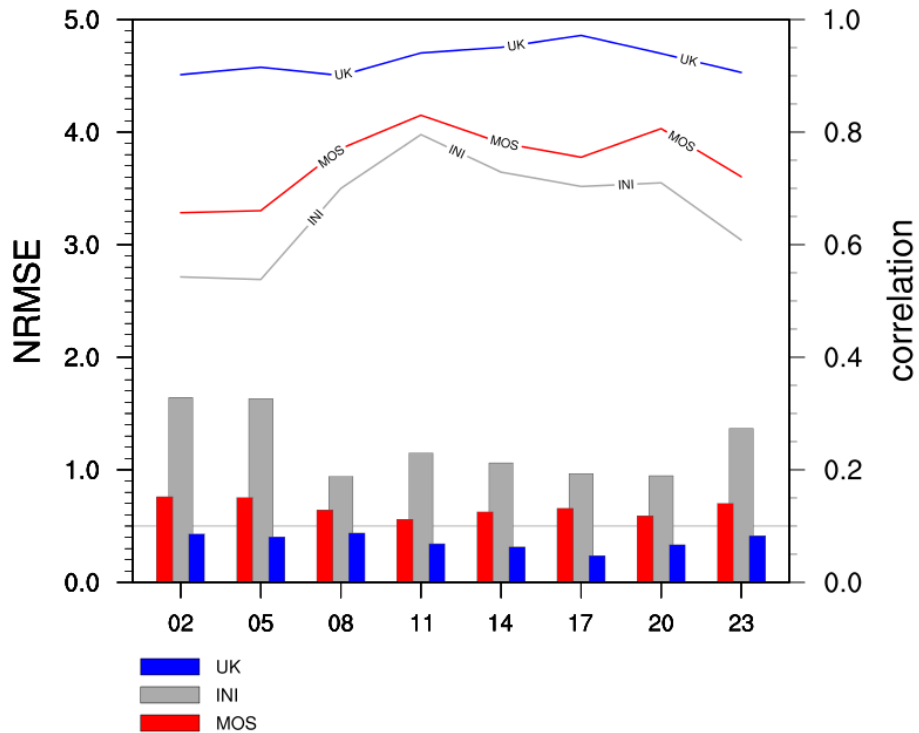


分析討論

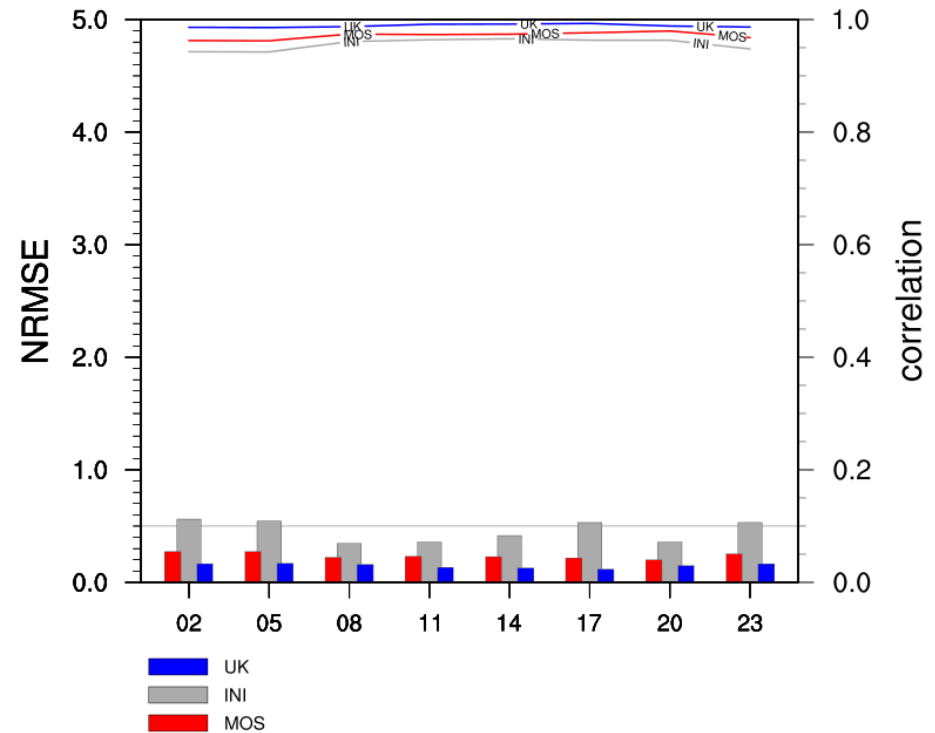


月份分析結果 8月 & 12月

08mm -- NRMSE & correlation

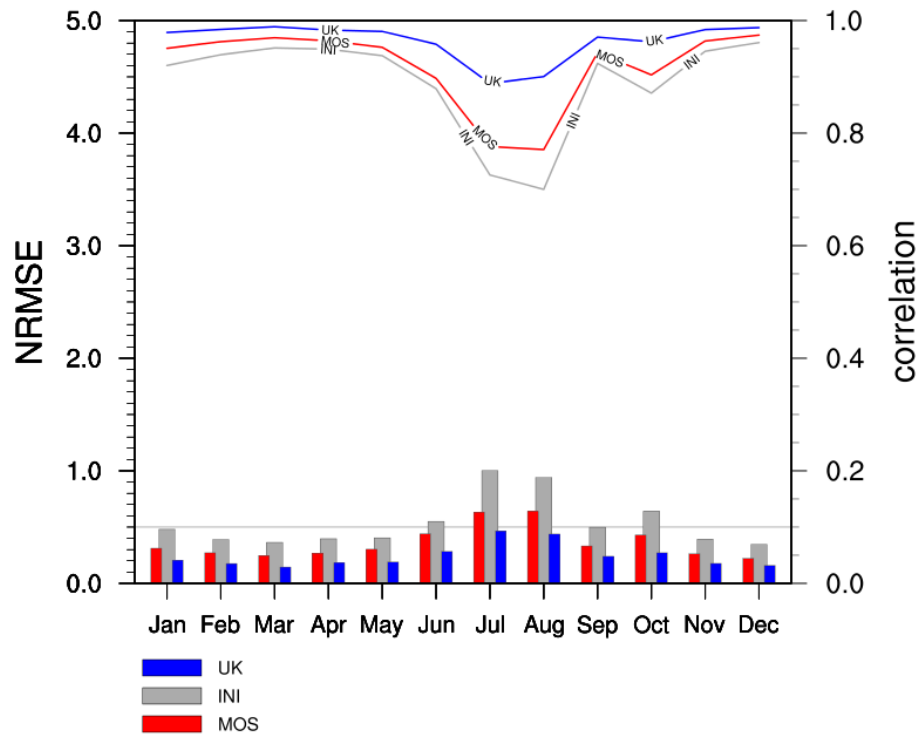


12mm -- NRMSE & correlation

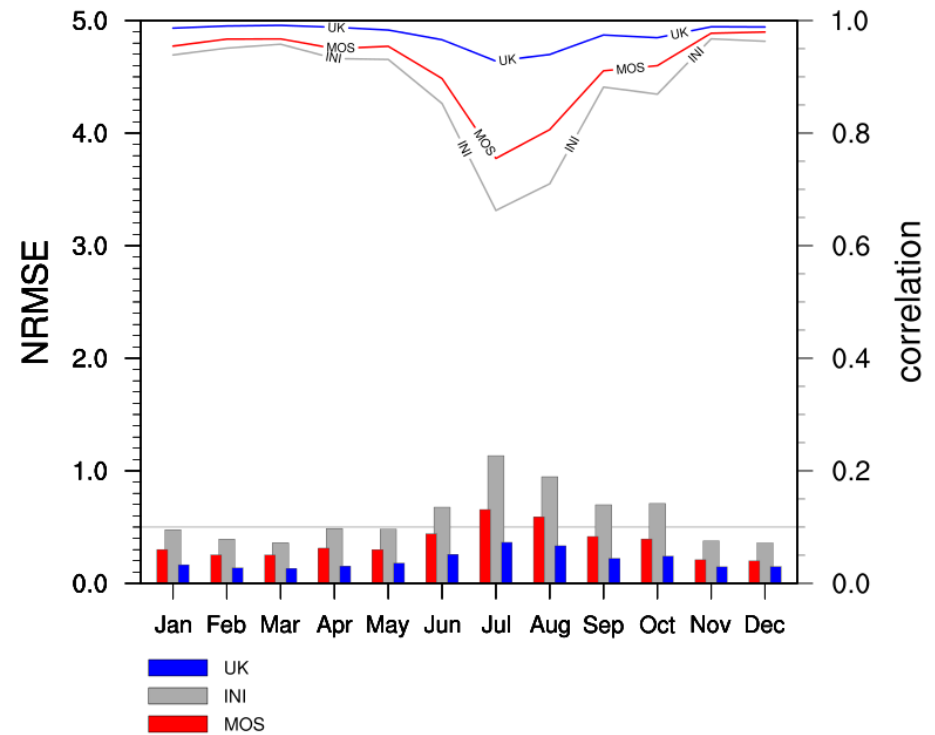


小時分析結果 8時&20時

08hr -- NRMSE & correlation

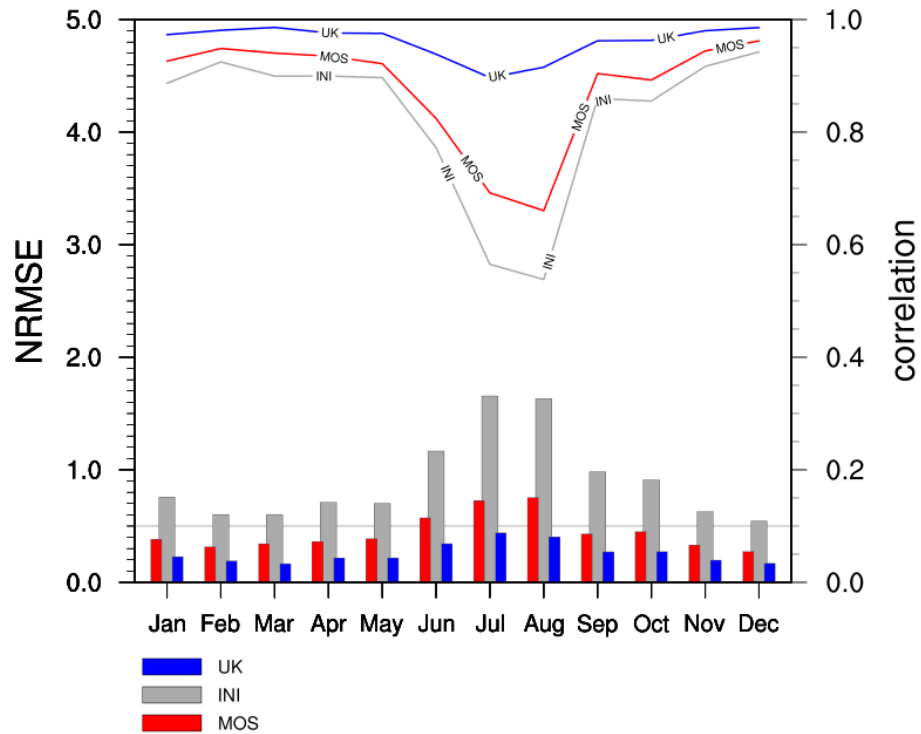


20hr -- NRMSE & correlation

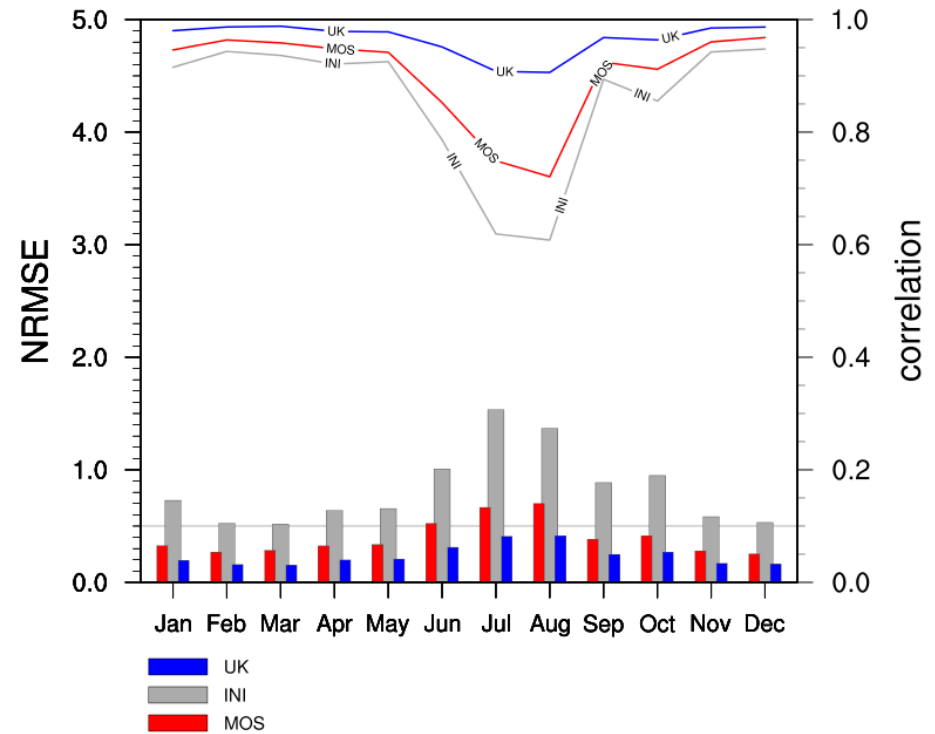


小時分析結果 5時&23時

05hr -- NRMSE & correlation

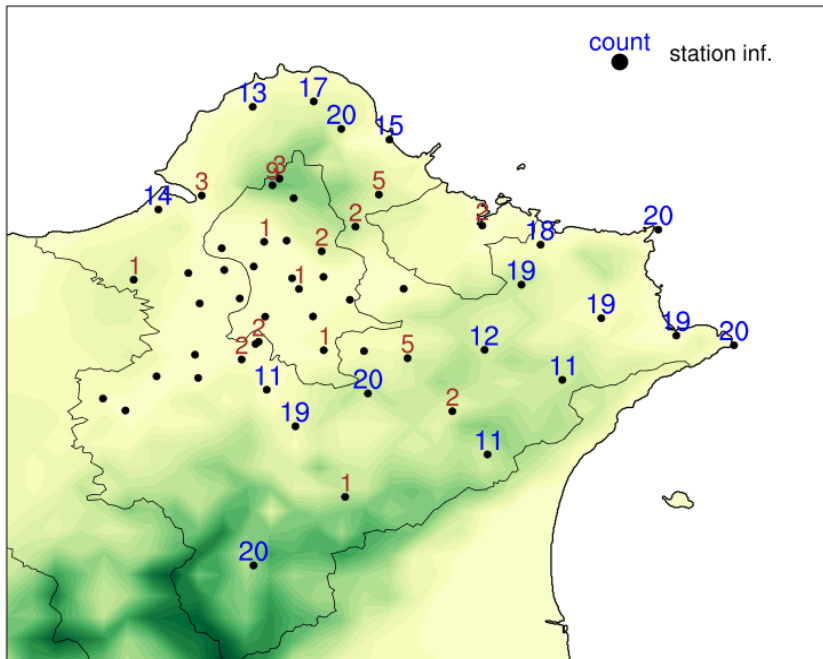


23hr -- NRMSE & correlation

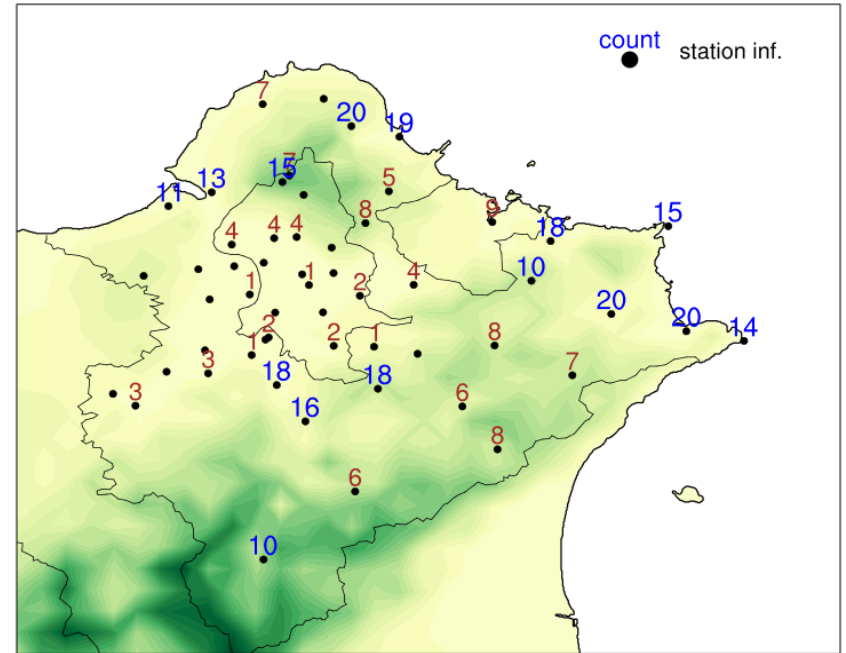


UK和MOS的30%資料分布

UK result



MOS result

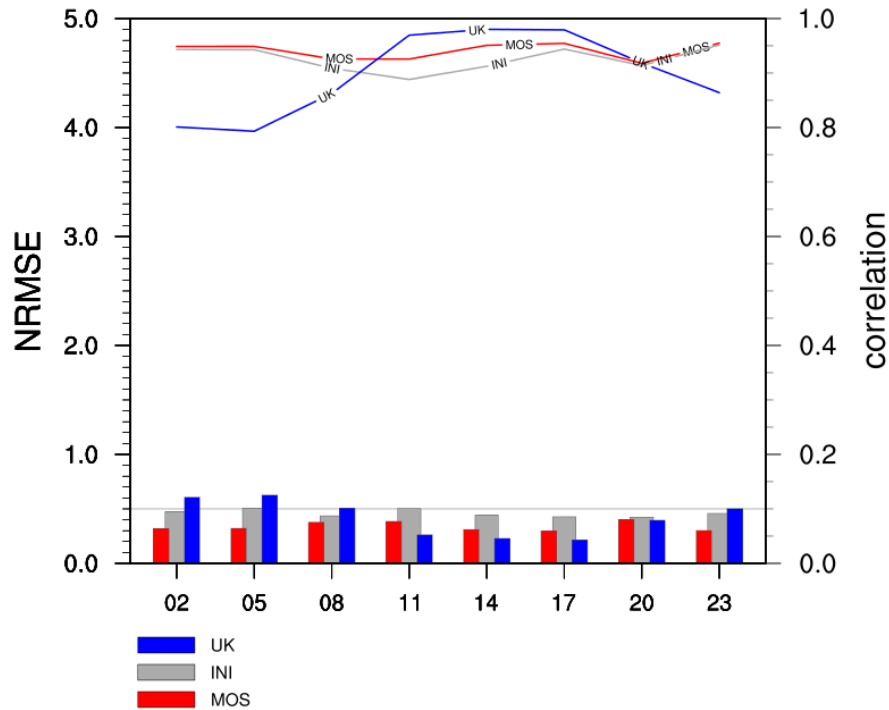


排序結果的後30%資料(相同小時的月變化與相同月份的時變化資料)計算數量超過10的為藍色，小於10的為褐色

單一測站結果

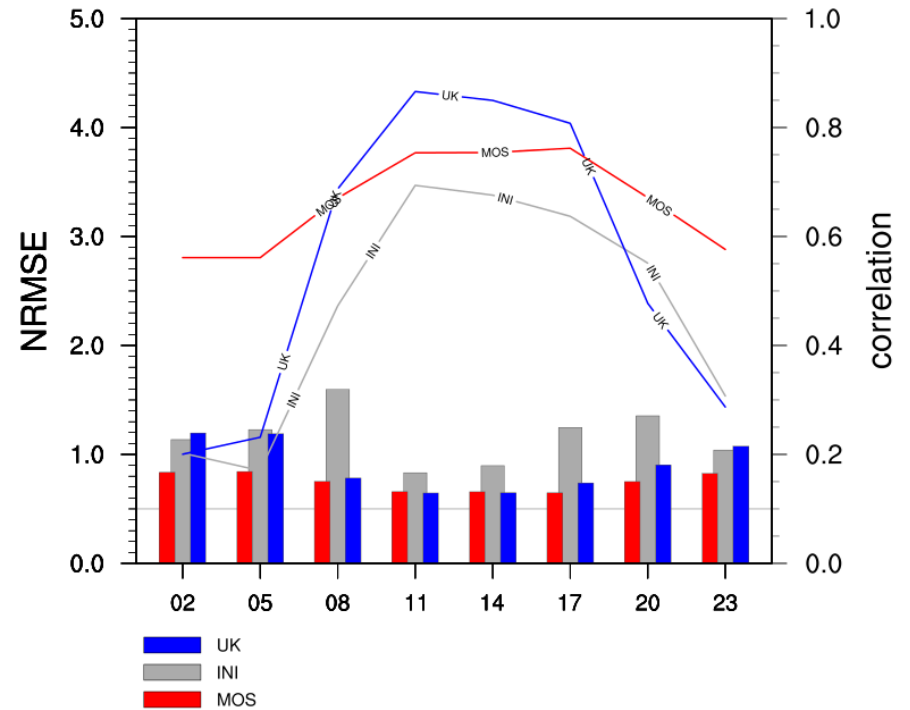
三貂角

C0A970_01mm -- NRMSE & correlation



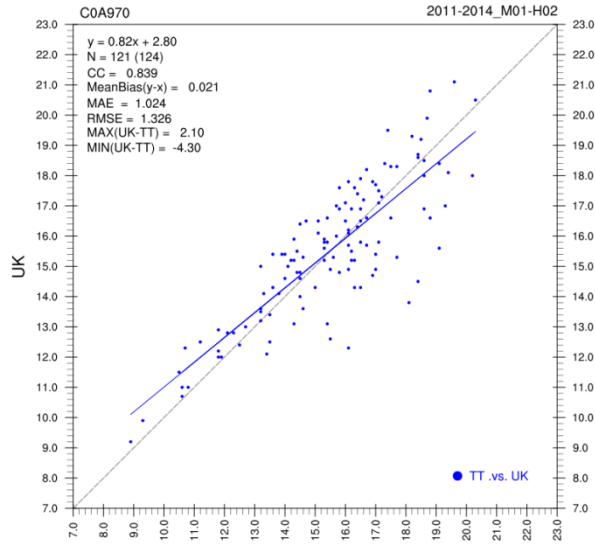
五分山雷達站

466850_08mm -- NRMSE & correlation

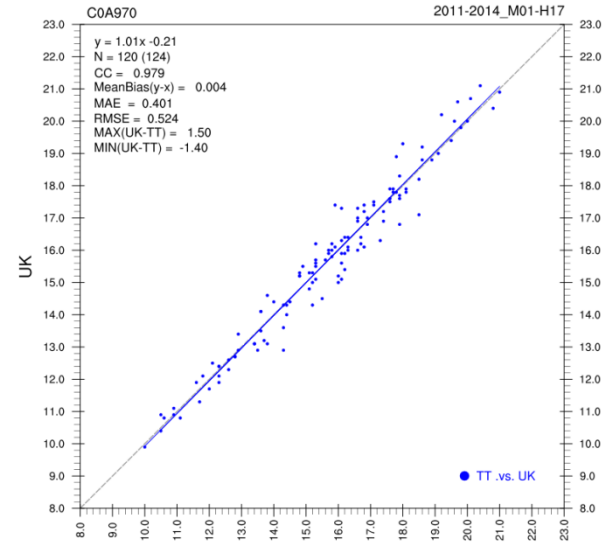


COA970三貂角 1月

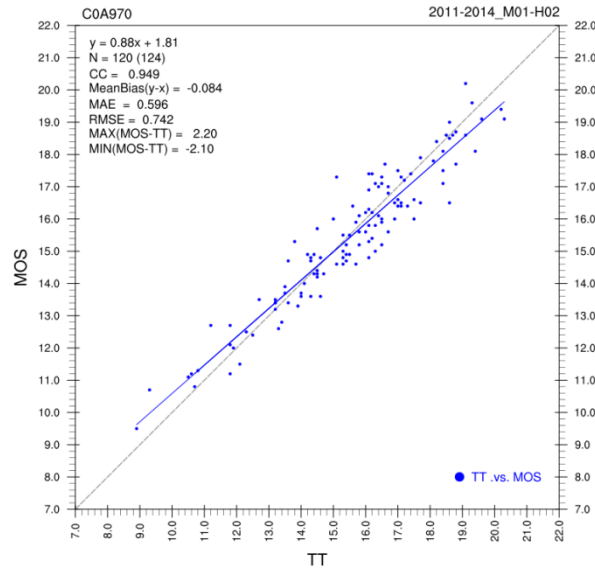
UK
02hr



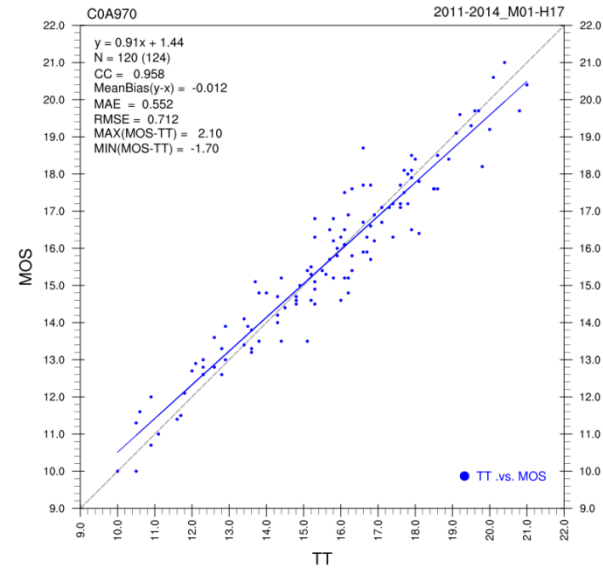
UK
17hr



MOS
02hr

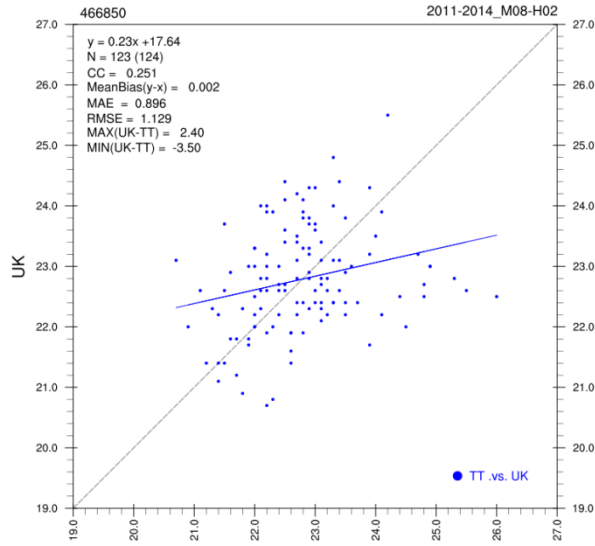


MOS
17hr

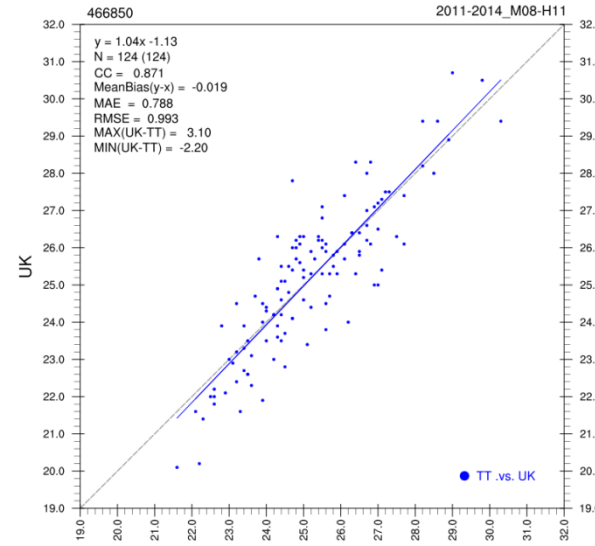


466850五分山雷達站 8月

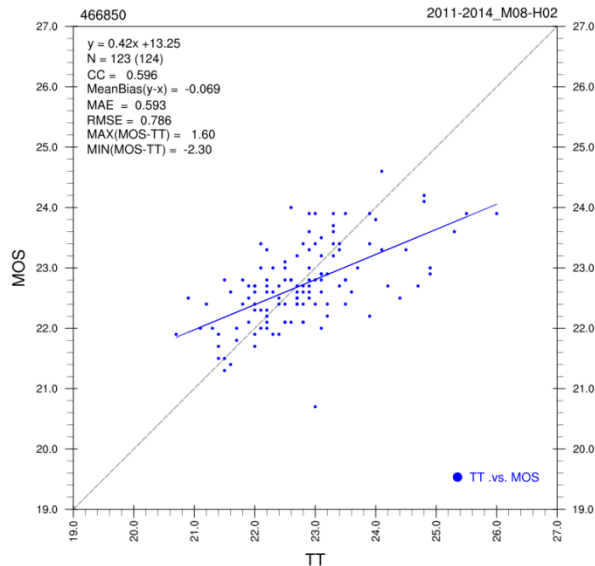
UK
02hr



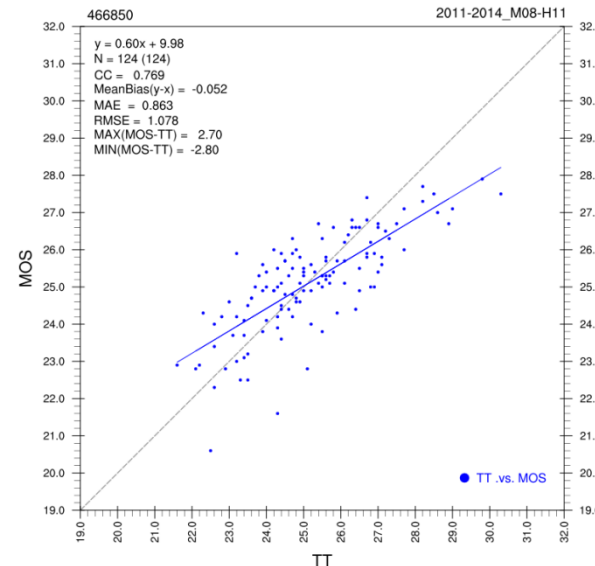
UK
11hr



MOS
02hr



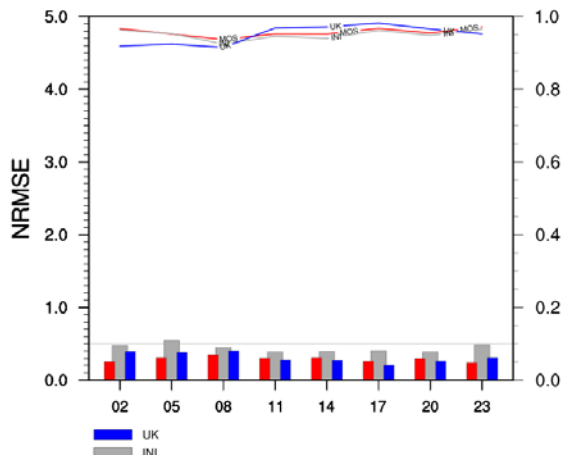
MOS
11hr



2-4月

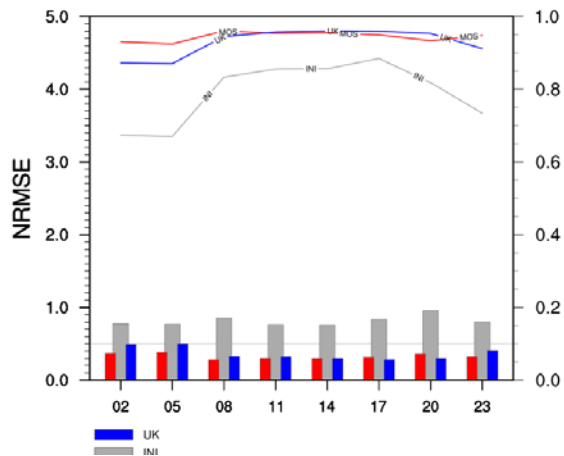
三貂角

C0A970_02mm -- NRMSE & correlation



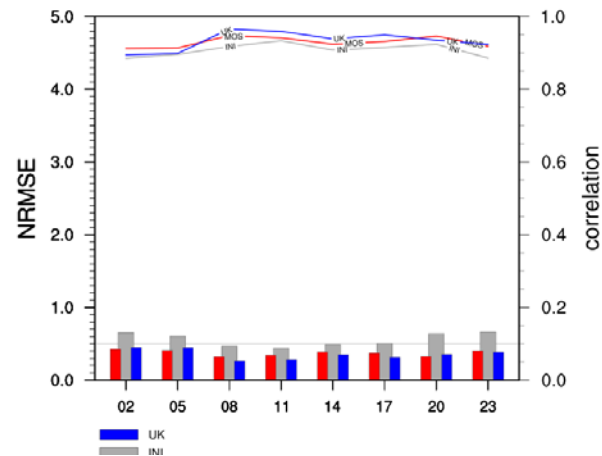
五分山雷達站

466850_04mm -- NRMSE & correlation



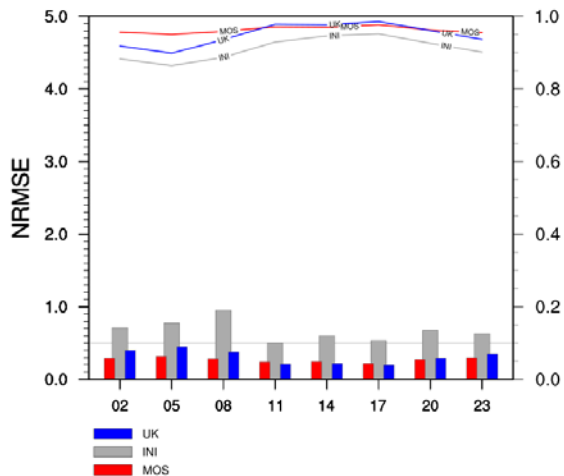
三和

C0A930_04mm -- NRMSE & correlation



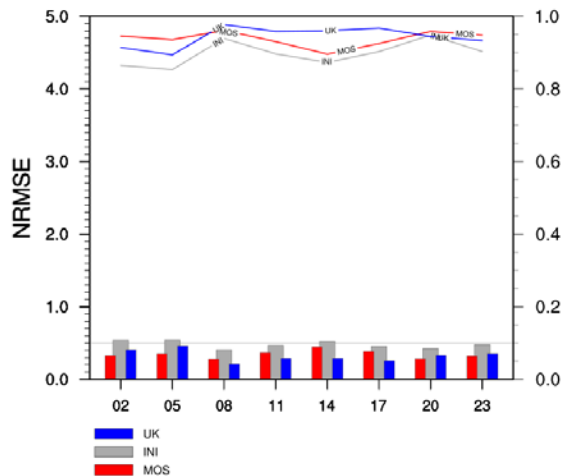
福山

C0A560_03mm -- NRMSE & correlation



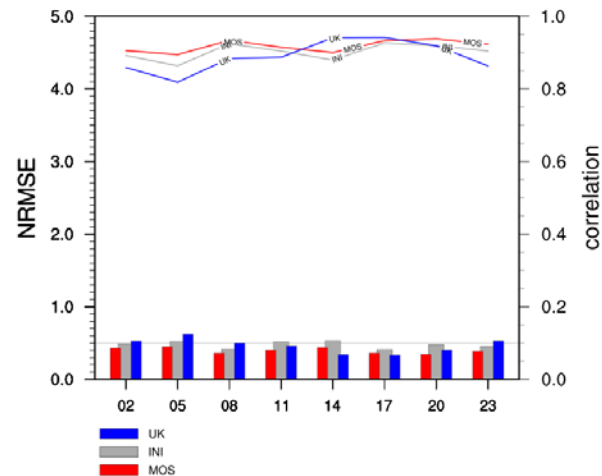
富貴角

C0A920_04mm -- NRMSE & correlation



瑞芳

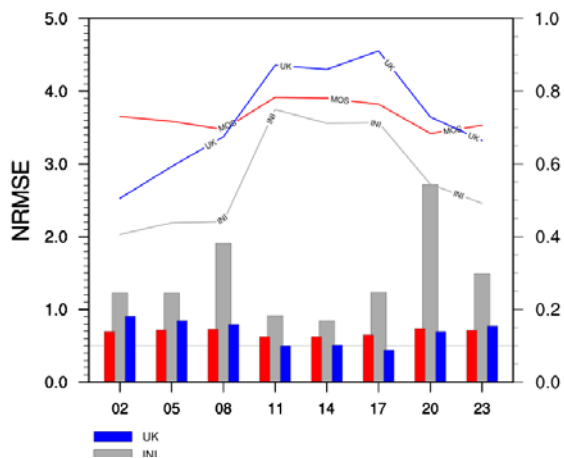
C0A660_05mm -- NRMSE & correlation



7月

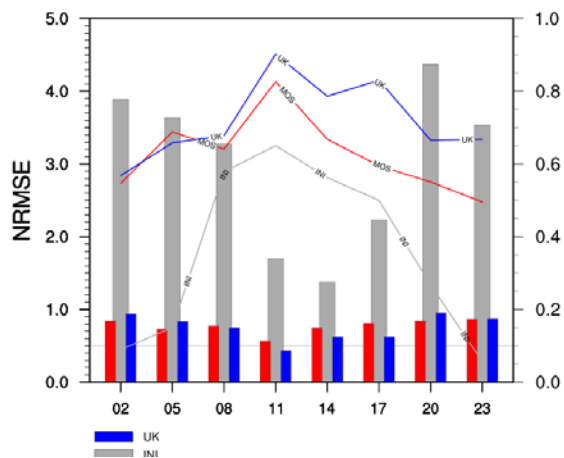
鞍部

466910_07mm -- NRMSE & correlation



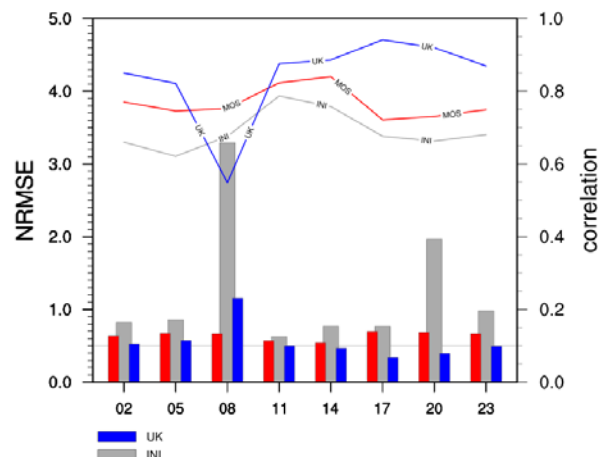
福山

C0A560_07mm -- NRMSE & correlation



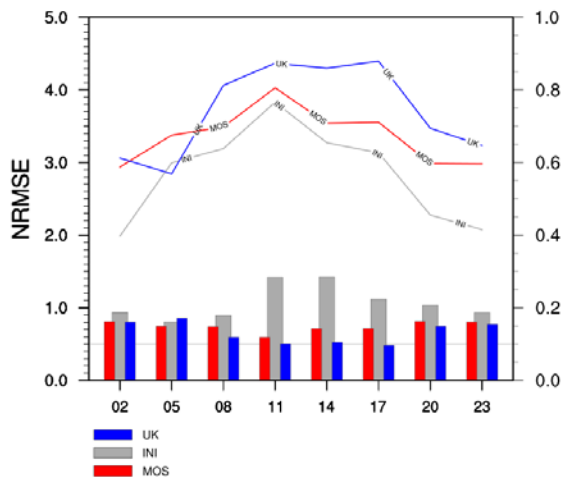
竹子湖

466930_07mm -- NRMSE & correlation



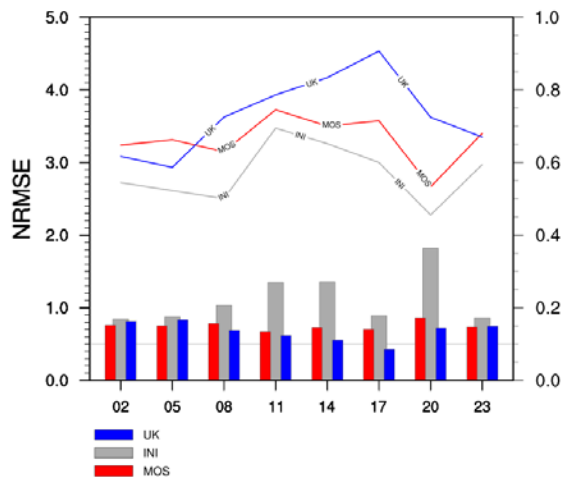
瑞芳

C0A660_07mm -- NRMSE & correlation



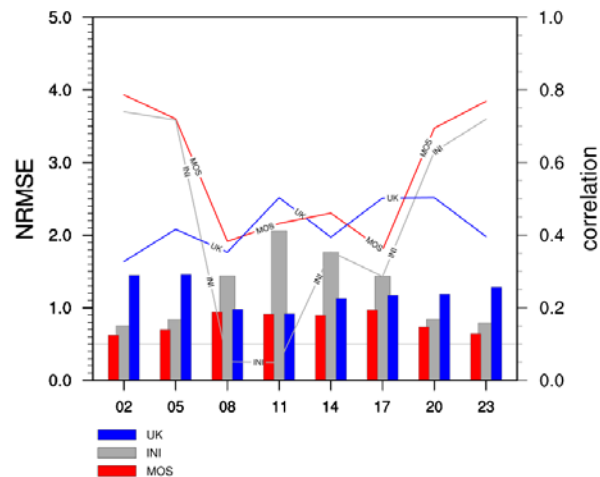
大坪

C0A860_07mm -- NRMSE & correlation



三貂角

C0A970_07mm -- NRMSE & correlation



結論

- 客觀方法分析與NWP降尺度分析提供的估計值有季節變化與日變化影響
- 在非7、8月期間，NWP資料可以做為臺北盆地地區的觀測值參考
- 在夜晚到清晨時間，MOS方法可以提供山區與海陸交界區測站較好的參考值
- MOS方法比簡易的Smart Init方法估計的結果較為良好

謝謝指教

Smart Init 概念

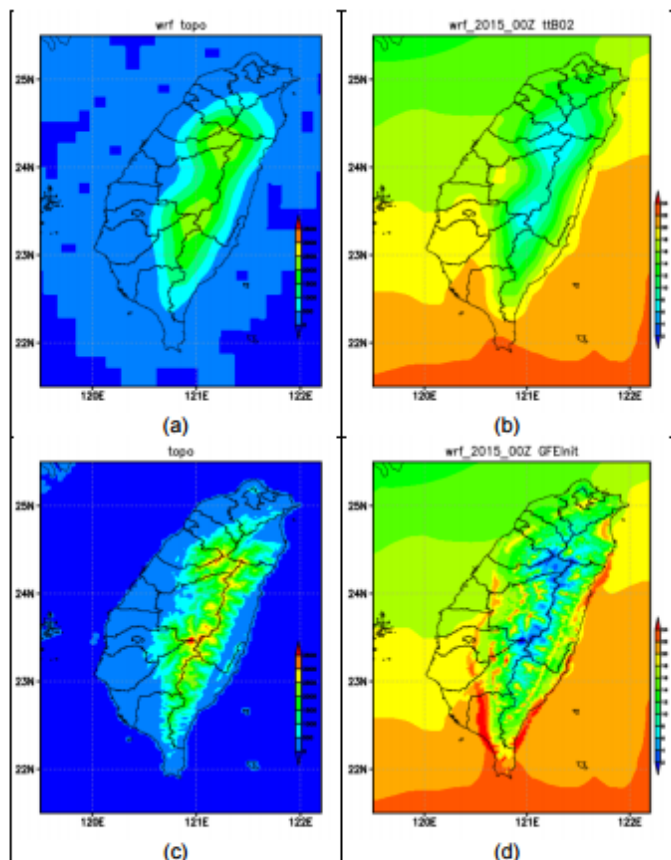
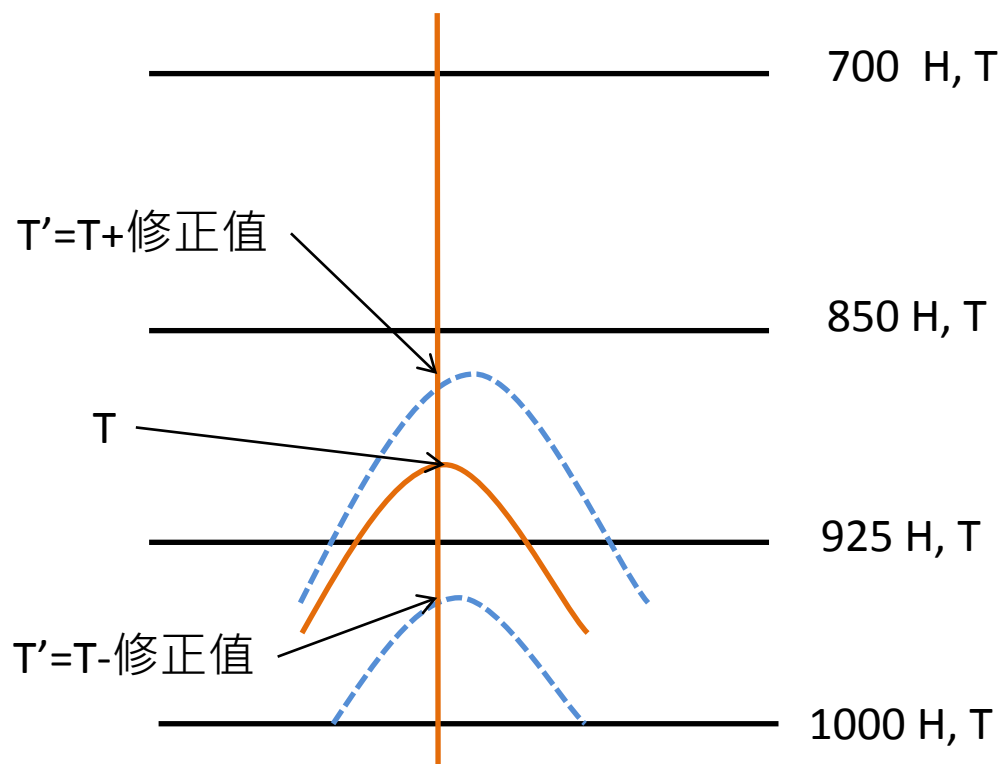


圖 2.1-1 氣象局 WRF 模式溫度場高度校正作業的(a)WRF 地形資料、(b)距地 2 米高溫度場、(c)GFE 地形資料及(d)經高度校正後的距地 2 米高溫度場



GFE地形

NWP地形

資料產製說明

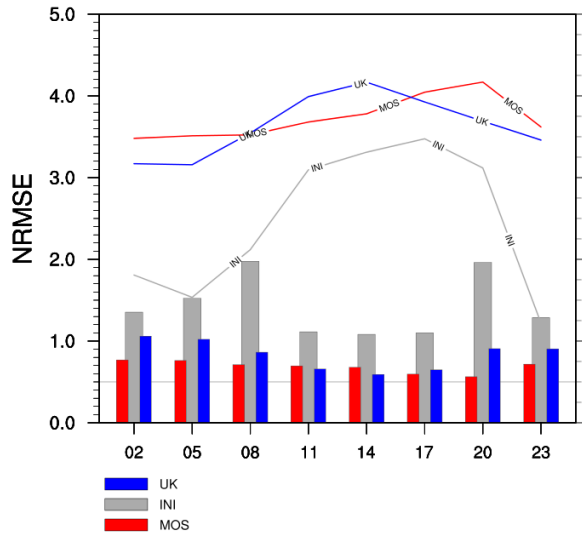
工具受限說明：

MOS—建模過程需要NWP資料和觀測資料做建模係數
預報(估計)過程需要建模係數

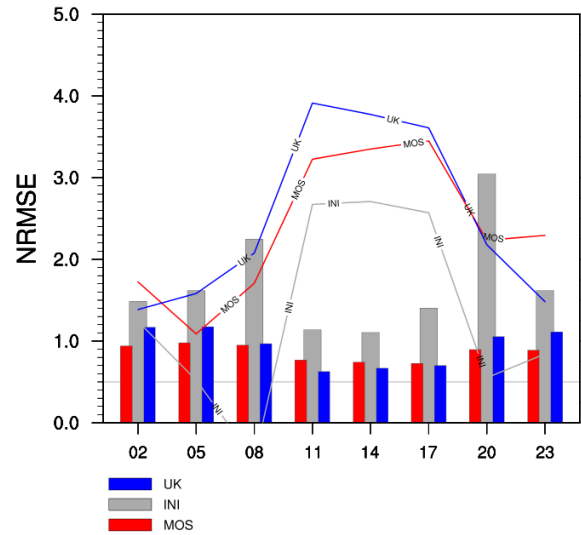
Smart Init—需要NWP和相關的地形資料

C0AC40大屯山 6-8月

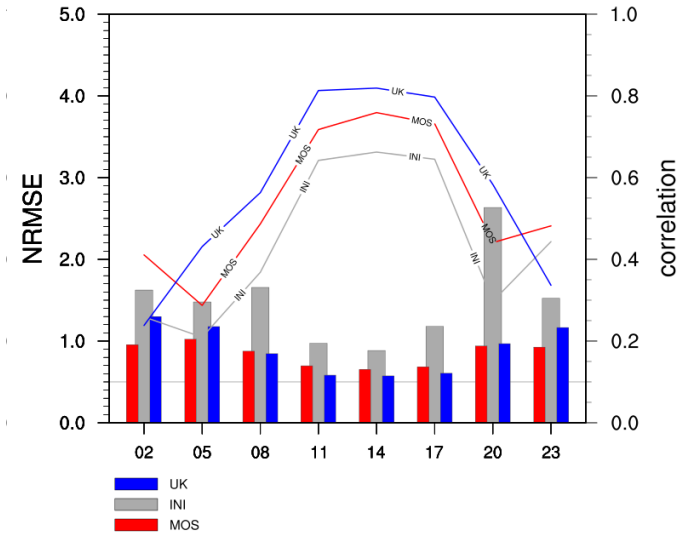
C0AC40_06mm -- NRMSE & correlation



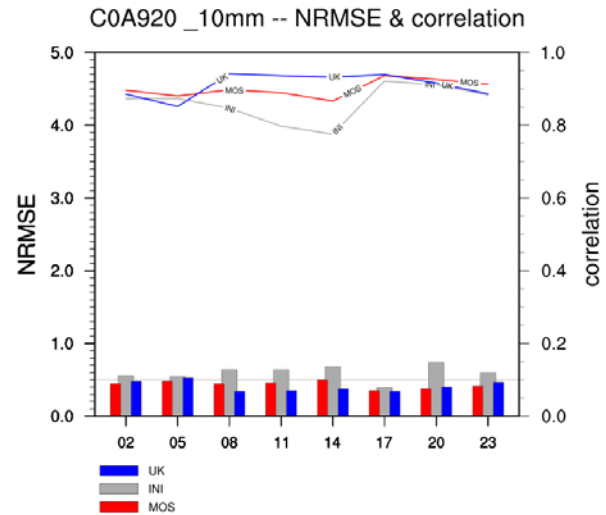
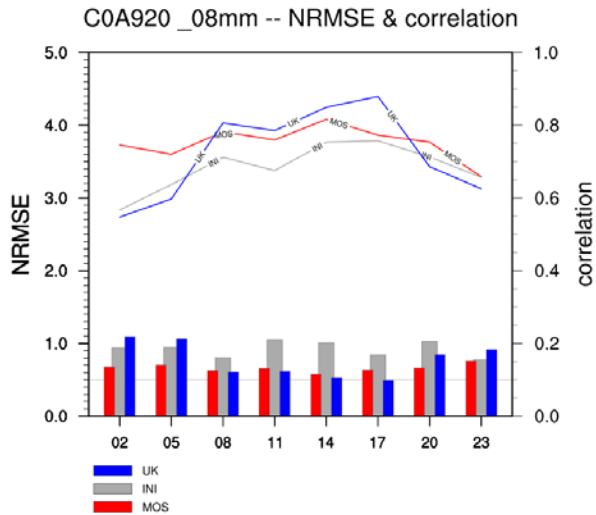
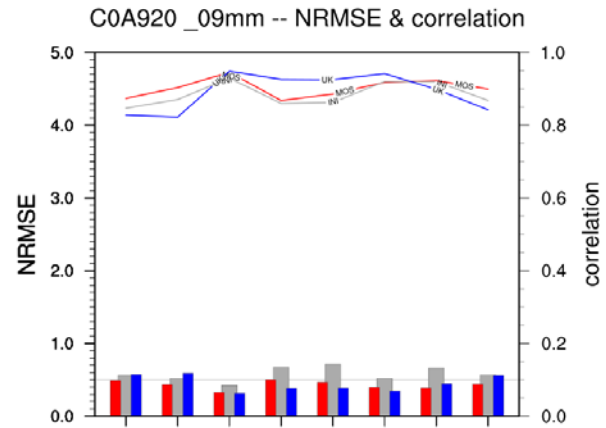
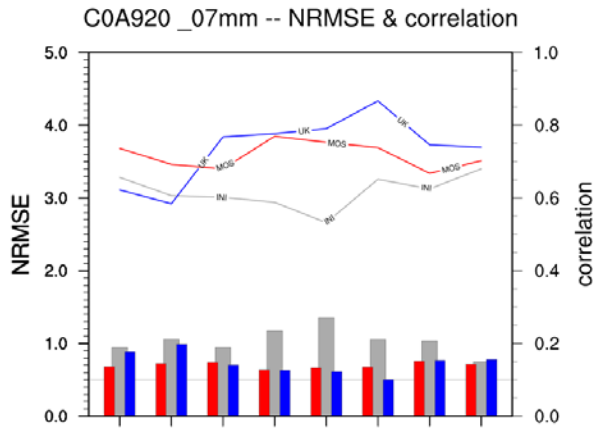
C0AC40_07mm -- NRMSE & correlation



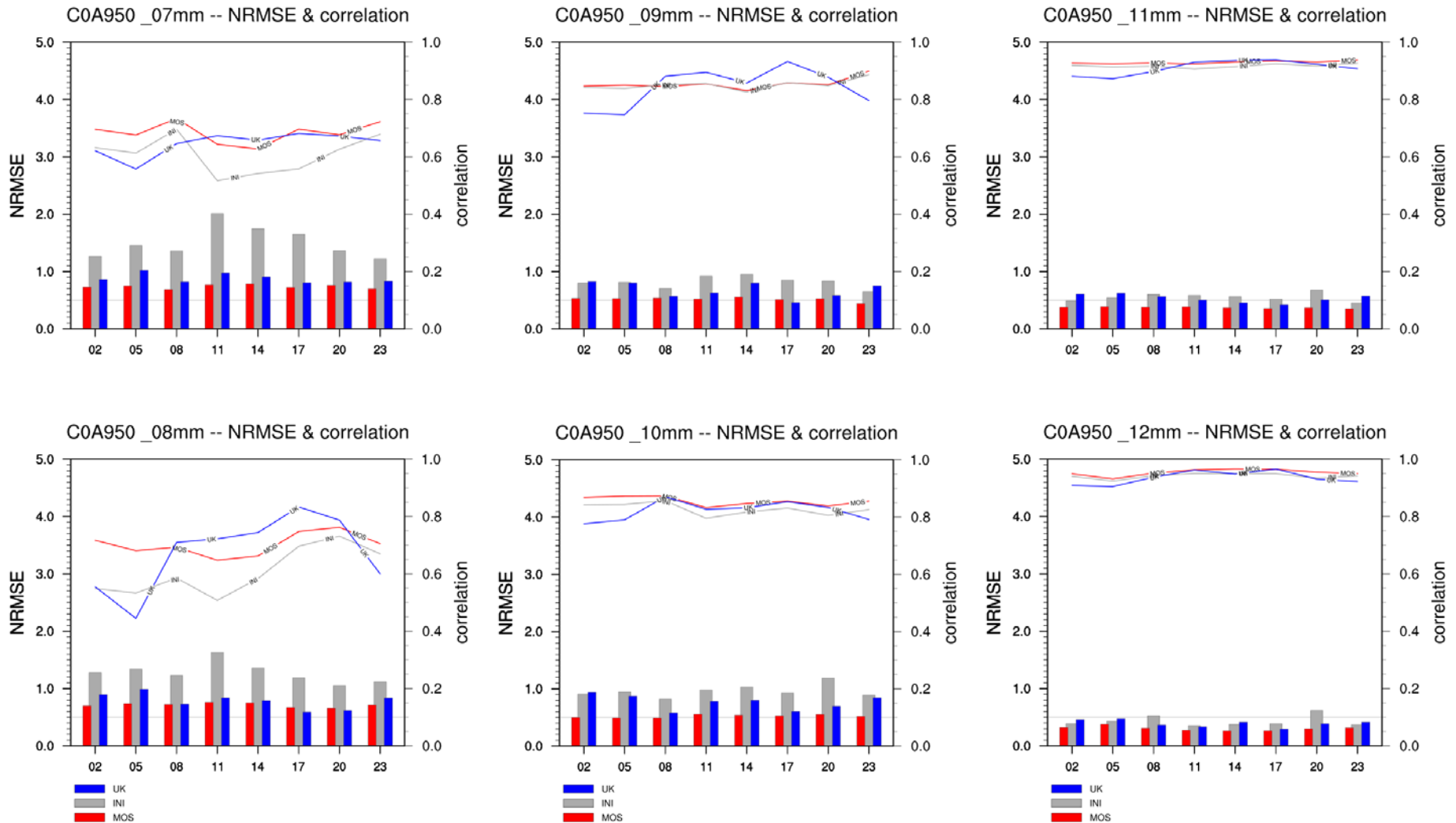
C0AC40_08mm -- NRMSE & correlation



C0A920富貴角 7-10月



C0A950鼻頭角 7-12月



82A750茶葉改良場文山分場 1-6月

