From Analyzing Satellite Data to Improving MJO Forecasts

Xiouhua (Joshua) Fu

INTERNATIONAL PACIFIC RESEARCH CENTER

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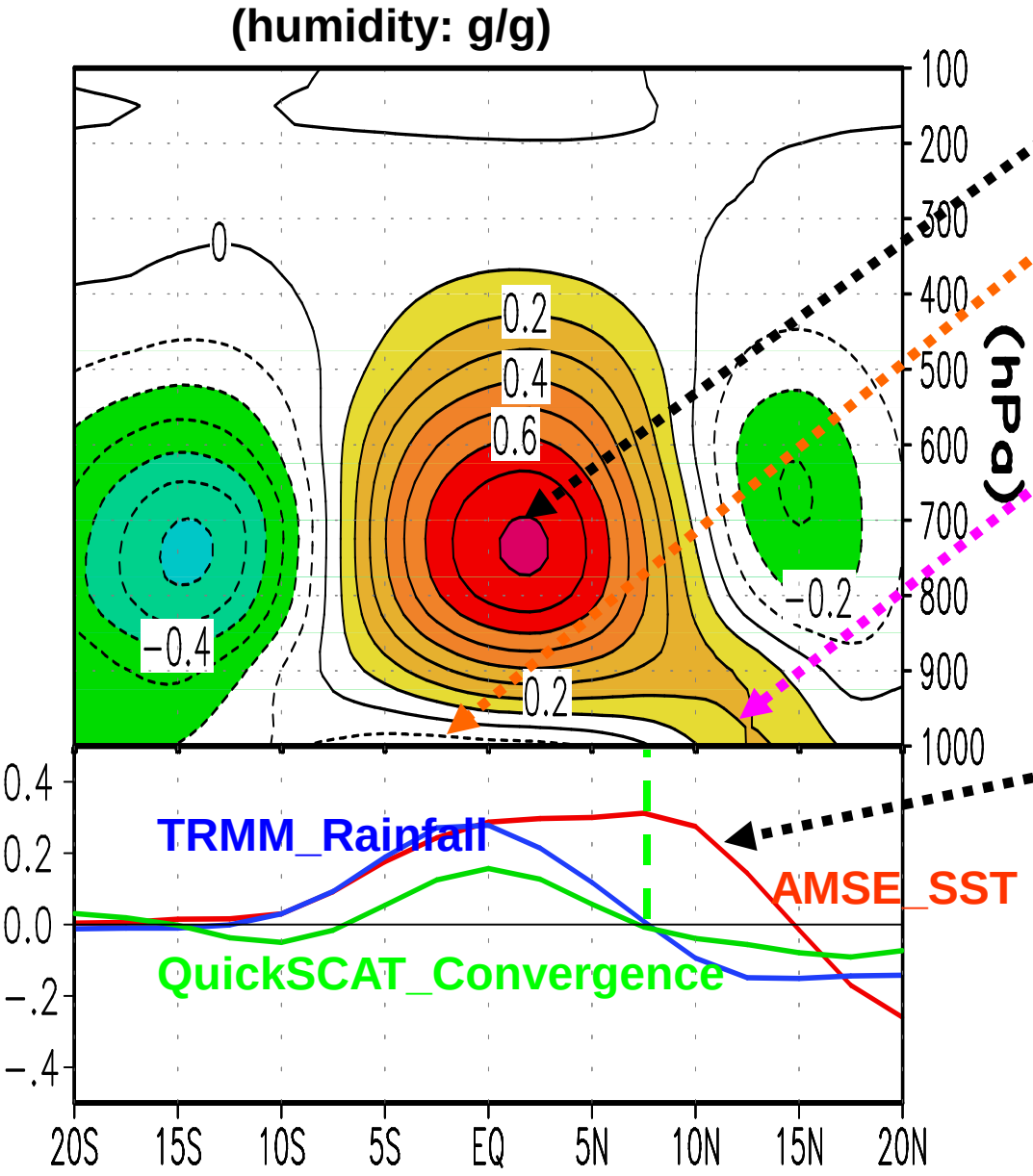
Major Features Revealed with AIRS Data



- Large moisture perturbation.
- Surface dry layer below ISO convection probably Induced by downdrafts.
- Low-level moistening ahead of the convection preconditions the northward movement of ISO.
- Positive SST anomaly rather than surface convergence is the major factor for the BL moistening in this period .

(Fu et al. 2006, GRL)

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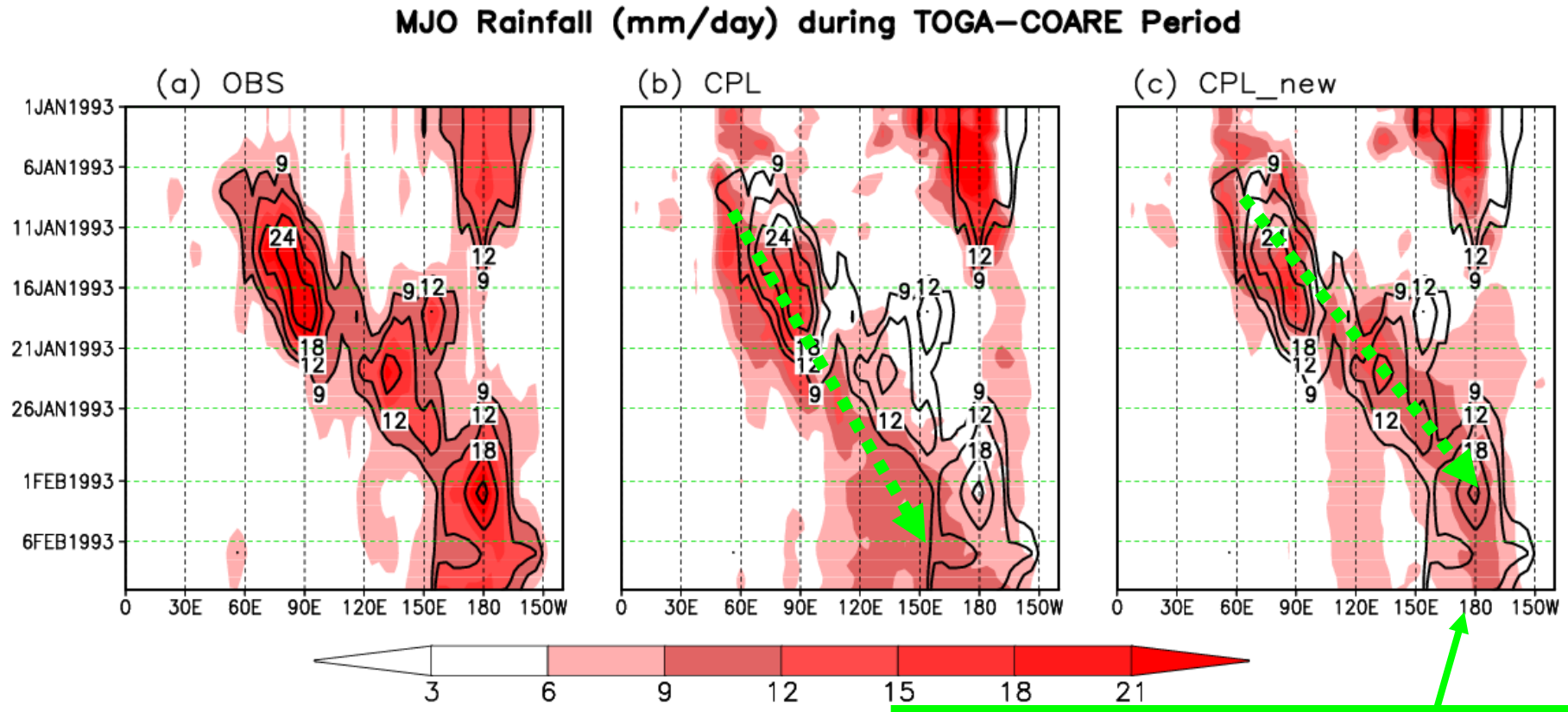
Experimental Forecast of a TOGA-COARE MJO Event



(Fu et al. 2008, AOSL)

☞Increase Downdrafts
☞Enhance Shallow-Convection Detrainment

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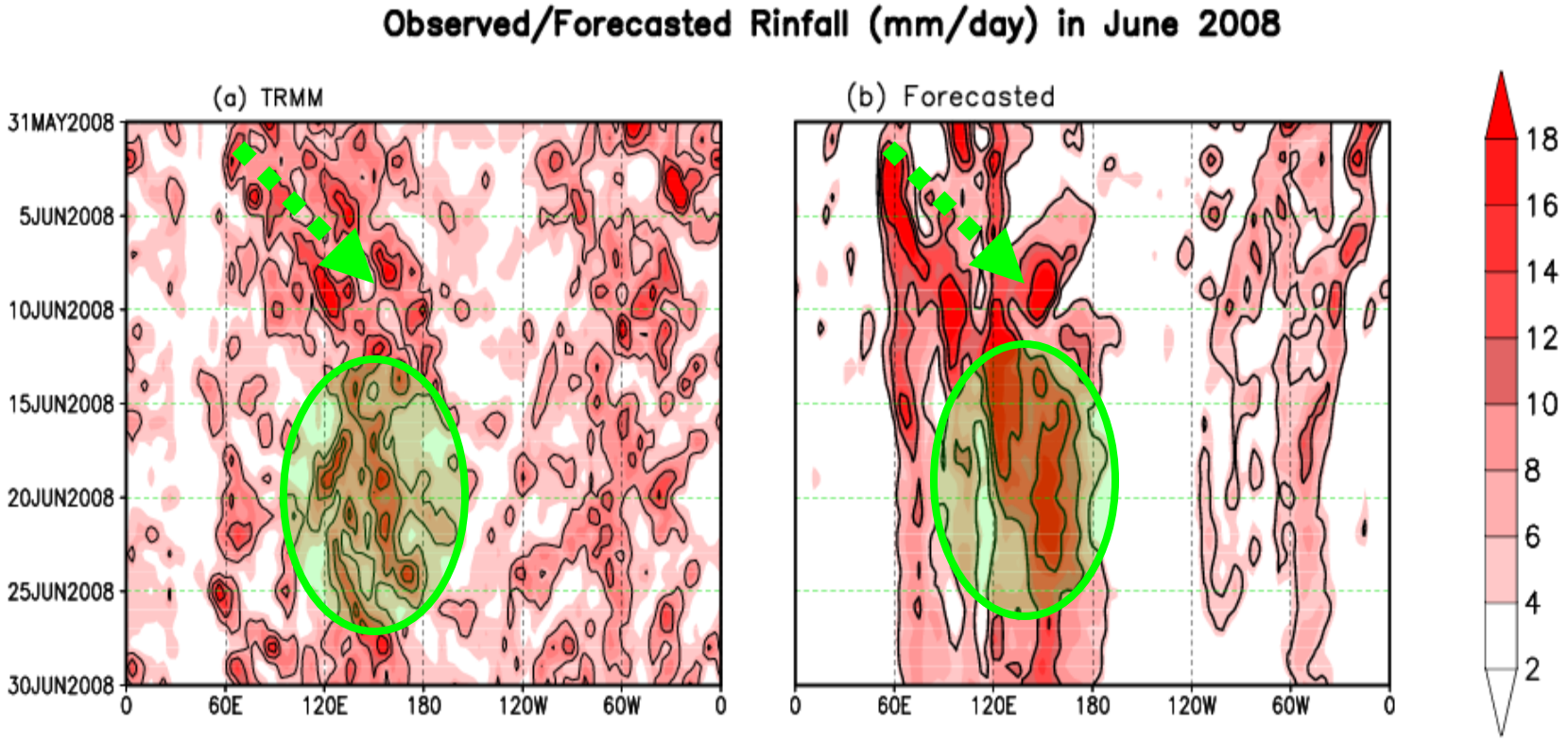
Experimental Forecast for June 2008



(Longitude)

Averaged between (10S-10N)

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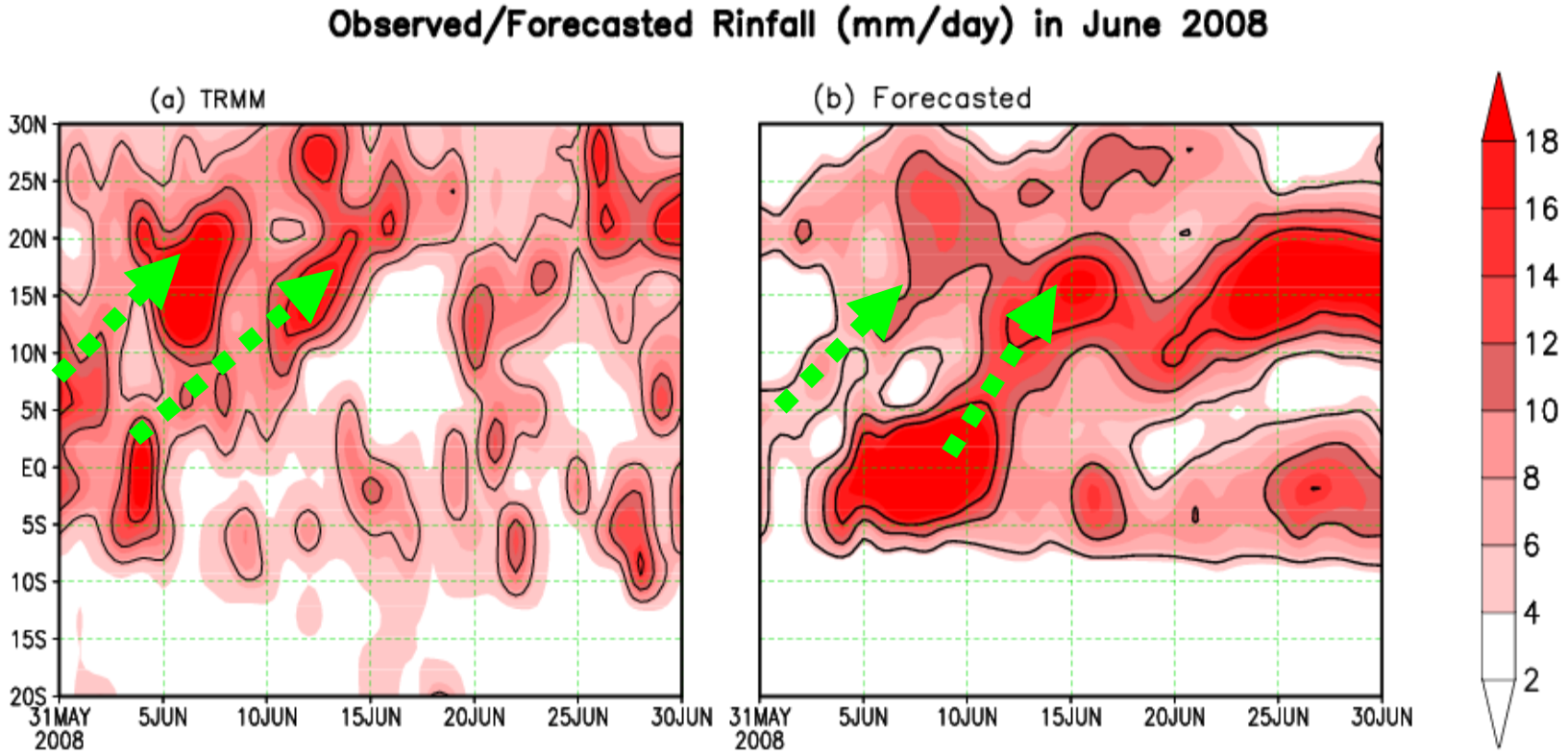
Experimental Forecast for June 2008



Averaged between (65E-95E)

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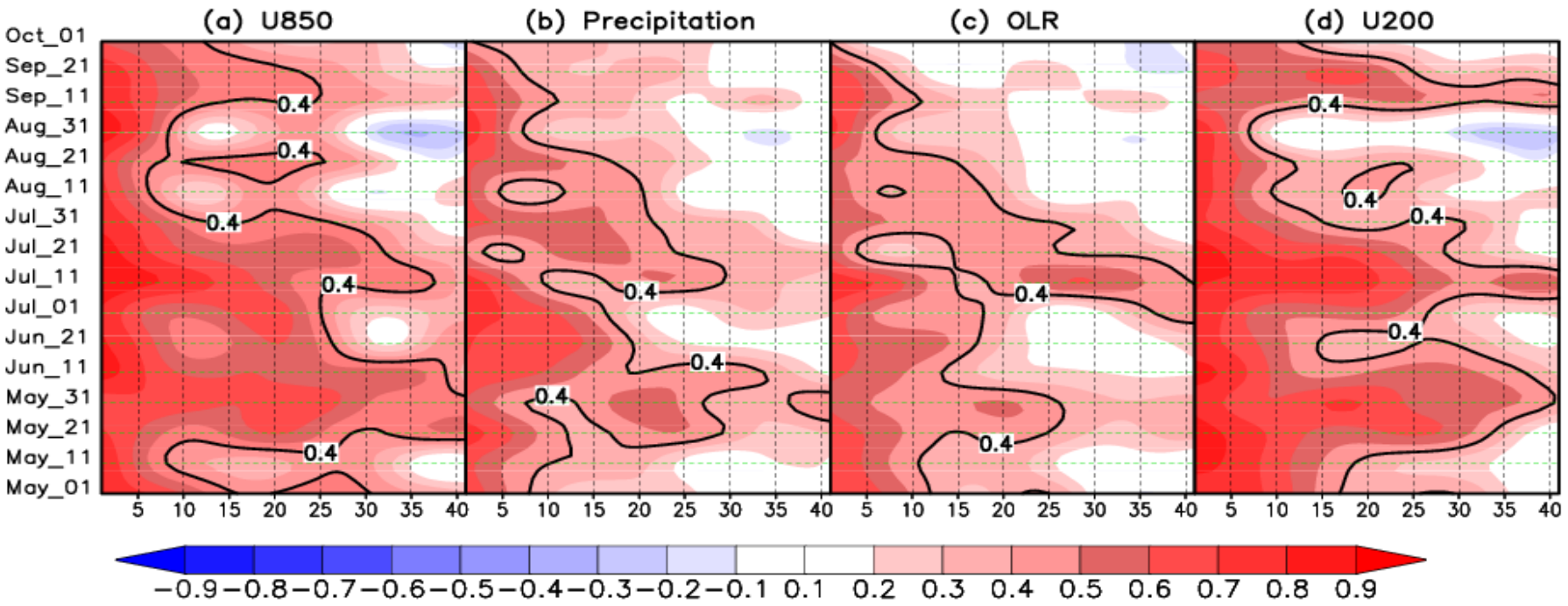
Possible Contribution to YOTC

Forecasts with ECHAM4+UH_IOM coupled model

- **Initialize our coupled model with YOTC high-resolution datasets (ECMWF, GMAO, NCEP)**
- **T30 => T106**
- **Carry out two-month forecasts every 3 days**
- **Each forecast with 10 ensembles**

Forecast Skill of ISO in 2004 Summer



Anomaly Correlation Coefficient (ACC) of 30-90-day filtered forecasts over global tropics (30°S-30°N) as functions of initial dates and lead time in days.

A hybrid coupled GCM (so called UH_HCM), developed at IPRC/University of Hawaii, is used to reforecast the ISO in 2004 summer. The model was initialized with modified NCEP reanalysis from May 1 to October 1, 2004, and allowed to run freely for 2 months. The seasonal averaged intraseasonal forecasting skills for 850-hPa zonal winds and rainfall reach 25 days and 15 days, respectively.