Evaluation of Multi-Satellite Surface Winds of MJO over the Indian Ocean using DYNAMO in-situ Observations

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Goal:

- Better OBSERVE and PREDICT high-impact tropical weather systems (tropical cyclones, the Madden-Julian Oscillation)

In this talk:

1. Develop an **MJO surface wind** database for weather and climate applications
2. Evaluate swathes (ASCAT, OSCAT, TMI) and multi-satellite products (CCMP and OAFlux) using DYNAMO in-situ surface winds observations
MJO

Rain

Surface zonal wind

SST
Surface wind in a tropical cyclone?
(no brainer!)

What is the MJO surface wind look like?

Infrared and ASCAT Within 2 Hours: 1500 UTC 2011124

QuikSCAT Mean Winds and Cloud Clusters > 5000 km²
for the 3 Days Ending 20091030

QuikSCAT Mean Winds and Cloud Clusters > 5000 km²
for the 3 Days Ending 20091110
Large-scale Precipitation Tracking (LPT), Kerns and Chen (2016, JGR)

TPW and rainfall rate, 2011-11-22

TRMM - 12mm
CCMP 6 hourly winds

Kerns and Chen (JGR, 2016, 2017)
DYNAMO data (Sept 2011 – Jan 2012)

3 Ships:
- R/V Revelle
- R/V Mirai
- R/V Baruna Jaya

14 Mornings:
- D1, D2, D3,
- RAMA 1-11
Unexpected “negative” impacts using in-situ observations in CCMP?
Summary

- We have an MJO surface wind database based on Large-scale Precipitation Tracking (LPT) using CCMP!

- Both swath winds and merged multi-satellite gridded winds are biased low in MJO (due to rain?) and biased high in trade winds (?).