Observations and modeling of ocean dynamics

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Brief talks included:

- Three examples of internal ocean processes that could affect SST and thereby feed back onto the MJO (Han, Li and Webber et al described by Smyth). Main focus on impact of changes to thermocline depth on SST.
- While most of the discussion focused on ocean-MJO feedbacks, it was noted that one-way effects of the MJO on the ocean can also have important consequences. For example, slowdown of the Indonesian Throughflow due to MJO-forced oceanic Kelvin waves.(Shinoda)
- Observations and model results of Rossby and Yanai waves on the equator were documented (Chen, Smyth).
- Observations of stratification, near-inertial waves and large-scale advection at 8S (Richards) – stressed the potential importance of stratification decoupling SST variations from change in thermocline depth, and advection of waters from the east

These were followed by a general discussion which led to the following.

Science questions:

- What ocean dynamical processes affect SST on the intraseasonal timescale? For example, what are the effects of oceanic Rossby waves in the SCTR region during the Winter MJO season? Is it really only about the thermocline depth? How do waves affect SST in other regions of high mean SST, such as the Eastern IO warm pool?
- How do the resulting SST variations feedback to the MJO?
- How do oceanic interannual variations such as the IOD modulate the ocean processes associated with the MJO?
- How well do upper processes such as mixing, diurnal warming, radiation of inertial waves have to be captured in models?

Action items:

- ❑ Analyze DYNAMO/CINDY surface and subsurface data, combined with satellite observations, to document oceanic processes that may be relevant to the MJO.
- ❑ Confront models with CINDY/DYNAMO data. Need both data assimilated products and free running models.
- ❑ Perform clever numerical experimentation with OGCM and CGMs to understand and quantify the impact of oceanic processes relevant to the MJO, and to determine the necessary ocean physics that needs to be captured in models used for MJO research and forecasting.