

Characteristics of MJOs Deduced from CINDY/DYNAMO/AMIE Sounding Data

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Preliminary analyses of observations from the two CINDY/DYNAMO/AMIE sounding arrays north and south of the equator have shed light on multi---faceted aspects of the October and November MJO events. The principal goal of the sounding network was to investigate the moistening processes during the initiation phase of the MJO. As it turned out, the northern sounding array (NSA) – added to the field campaign at eleventh hour – contained by far the strongest MJO signal, so data from that network has been the primary focus of our investigation.

Highlights of some of the preliminary findings to date are:

- The overall sounding operation was a great success; work on quality control is continuing; quality---controlled, high---resolution sounding data have been released for sites in the two quadrilateral arrays
- Precipitation over the NSA was strongly modulated by MJOs in October and November, whereas the southern sounding array (SSA) had more persistent, briefer episodes of precipitation related to the ITCZ
- Over the NSA the October MJO was characterized by gradual moistening over a ~two---week period associated with multiple two---day disturbances
- The November MJO over the NSA had a more rapid moisture build---up with the active phase comprised of two strong Kelvin waves
- A stepwise moistening was apparent with both MJOs; the relation to cloud populations is yet to be determined
- Apparent moisture sink Q2 profiles differ between NSA and SSA; a greater fraction of stratiform precipitation over NSA is implied
- A trade---like cumulus regime was present in the first half of October over the NSA with cloud moistening balanced by subsidence and zonal advection of dry air
- The tropical tropopause layer (TTL) was significantly modulated during MJO passage on both several---day and monthly time scales
- Atmospheric well---mixed layers observed for ~70% of the soundings from the R/V *Revelle* and Gan Island; mean mixed---layer depth ranged from 473 m at the *Revelle* to 505 m at Gan Island
- The atmospheric mixed was modulated on multiple time scales: monthly (associated with the MJO), several days (equatorial disturbances), the diurnal cycle, and hours (convective systems)