

## 1. Introduction

The Madden-Julian oscillation (MJO), that is a dominant eastward propagating intraseasonal oscillation in the Tropics, is a key issue to be solved, as it influences not only the tropical atmospheric and oceanic variations but also the global climate. Since the MJO is a phenomenon coupled with deep cumulus convections, it is manifested over the warm pool region from the Indian Ocean through the western Pacific Ocean.

Recent studies using reanalysis and satellite data revealed various aspects of the large-scale MJO structure. However, current general circulation models still fail to simulate the “slow” eastward propagation and underestimate the strength of the intraseasonal variability. It is believed that this deficiency is mainly due to the insufficient cumulus parameterization. Therefore, fine-scale observation data is invaluable to promote our knowledge on the mechanism of the MJO.

In 2006, we JAMSTEC conducted the field campaign named MISMO (Mirai Indian Ocean cruise for the Study of the MJO-convection Onset) during R/V Mirai MR06-05 cruise. The project captured the activation phase of an intraseasonal variation, or “aborted MJO”, and reveals that the zonally-propagating disturbances play important roles. For the further analyses, on the other hand, it is desired in the upcoming projects to elongate the observation period to capture the whole cycle of MJO(s) with finer spatial / temporal structure in higher accuracy.

To achieve further detailed understanding of MJO over the Indian Ocean, we in JAMSTEC organized the international project CINDY (Cooperative Indian Ocean Experiments on Intraseasonal Variability in the Year 2011). With the cooperation with the various countries, especially the project DYNAMO (Dynamics of the Madden-Julian Oscillation) from the United States, the field campaign was planned from October 2011 to March 2012. The R/V Mirai MR11-07 cruise was carried out as a component of the CINDY field campaign.

The cruise consists of two legs in October and November. During the cruise, we basically stayed (8S, 80E) to obtain continuous and high temporal-resolution data set for both atmospheric and oceanic states. The principle component of the observations are the surface meteorological measurement, atmospheric sounding by radiosonde, CTD casting, ADCP current measurement, oceanic profile of the turbulent mixing, as well as Doppler radar observation. In addition, bio-geochemical parameters on the sampled water, turbulent flux measurement, Mie-scattering LIDAR, vertical-pointing cloud radar, ozone and water vapor sonde, and other many observations were intensively conducted. Furthermore, the continuous observations are also carried out on the way to and back from the (8S, 80E) station, to capture the spatial and temporal variation of the atmospheric and oceanic status.

This cruise report summarizes the observed items and preliminary results during this cruise. In the first several sections, basic information such as cruise track, on board personnel list are described. Details of each observation are described in Section 5. Additional information and figures are also attached as Appendices.

With this cruise report, the information about the CINDY project and MR11-07 cruise could be referred at CINDY web site (<http://www.jamstec.go.jp/iorgc/cindy/>).

### \*\*\* Remarks \*\*\*

**This cruise report is a preliminary documentation as of the end of the cruise. The contents may be not updated after the end of the cruise, while the contents may be subject to change without notice. Data on the cruise report may be raw or not processed. Please ask the Chief Scientists for the latest information.**