
MR01-K05 Leg3-4 Cruise Summary



1. Cruise Title

The Study of the Air-Sea Interaction in the Tropics
Cruise code : MR01-K05 (Leg-3 and 4)

2. Objectives and Overview

Air-sea interaction is a key factor to understand the atmospheric and oceanic phenomena over the Tropical Western Pacific Ocean where the warmest sea surface temperatures exist and is called warm water pool. In the current cruise, precipitation mechanism caused by the cloud clusters that are accompanied with MJO(Madden-Julian Oscillation) was the main target to be studied.

For the purpose above mentioned, stationary observation was conducted at (2N, 138E) for the period of one month from November 9 through December 9, 2001. During the intensive observation period (IOP), C-band weather Doppler radar, atmospheric sounding by radiosonde, surface meteorological measurement, CTD casting down to 500m, and ADCP current measurement were carried out as main missions. In addition, turbulent flux measurement, solar radiation measurement, 95GHz cloud radar, LIDAR, greenhouse gases measurement, and other many observations were intensively conducted.

From the cloud images of Geostationary Meteorological Satellite of Japan Meteorological Agency shown in Fig.1, it is evident that convectively active phase of MJO passed over the observational area in the last 10 days of IOP. During the whole observation period, westerly were dominant in the lower troposphere(Fig.2a). Accompanied with cloud activities there were two peaks of strong westerlies in mid-November and early December, respectively. Furthermore, meridional wind components in Fig.2b suggest that equatorial trapped waves were prevailed in this period.

3. Period

Nov. 7, 2001 departed Koror, Republic of Palau

Dec. 11 – 13, 2001 called at Koror, Republic of Palau

Dec. 19, 2001 arrived at Yokohama, Japan

* Stationary observation at (2N, 138E) was conducted from Nov. 9 through Dec. 9.

4. Chief Scientist

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5. Themes and Participants List

- Study of the air-sea interaction in the tropical western Pacific region.
K.Yoneyama, M.Katsumata (JAMSTEC), J.-Y.Chen, S.Iwasaki(FORSGC)
- The study of energy balance and greenhouse gases through the sea surface.
O.Tsukamoto, S.Takahashi, K.Okada, K.Moritou (Okayama Univ.), E.Yamashita, H.Idehara (Okayama Univ. of Sci.), T.Nagasawa, O.Hirayama(Osaka Univ.)

- The study of solar radiation and ocean colors over the tropical western Pacific.
K.Kouzai, M.Hayashi, M.Shimanoue, M.Egawa(Maritime Univ. of Kobe), K.Ishida (Toba-Natl.College), N.Nakatani, T.Shiozaki(Osaka Pref. Univ.), Y.Okada(Kinki Univ.)
- LIDAR observation of aerosols and clouds over the Pacific Ocean.
I.Matsui (NIES)
- Cloud and aerosol observations by 95GHz vertical pointing cloud radar.
A. Kamei (CRL)
- Study of optical properties of atmospheric aerosol over ocean by sky radiometer.
Nobody was onboard (Hokkaido University)
- Continuous geological survey.
Nobody was onboard (JAMSTEC)
- Continuous pCO₂ measurement.
A.Murata (JASMTEC)
- Study for ocean temperature energy cycle.
N.Noda, K.Urata, K.Fukumiya (Saga Univ.)
- Technical Staff
M.Hanyu, S.Sueyoshi, K.Sakamoto (GODI), N.Komai, S.Ozawa, K.Sagishima, M.Kamata, K.Shiraishi, M.Yoshiike, N.Takahashi, F. Matsunaga, F.Ookawa (MWJ)

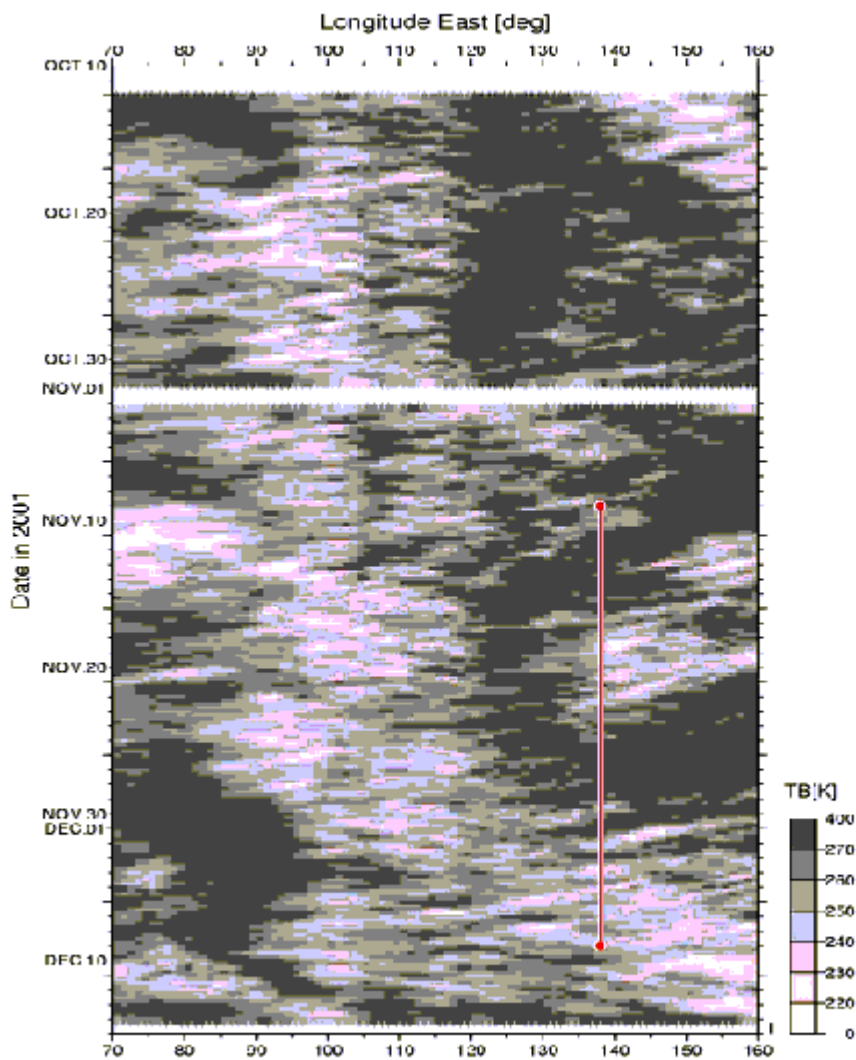


Fig.1 Time-Longitude cross section of GMS TBB.

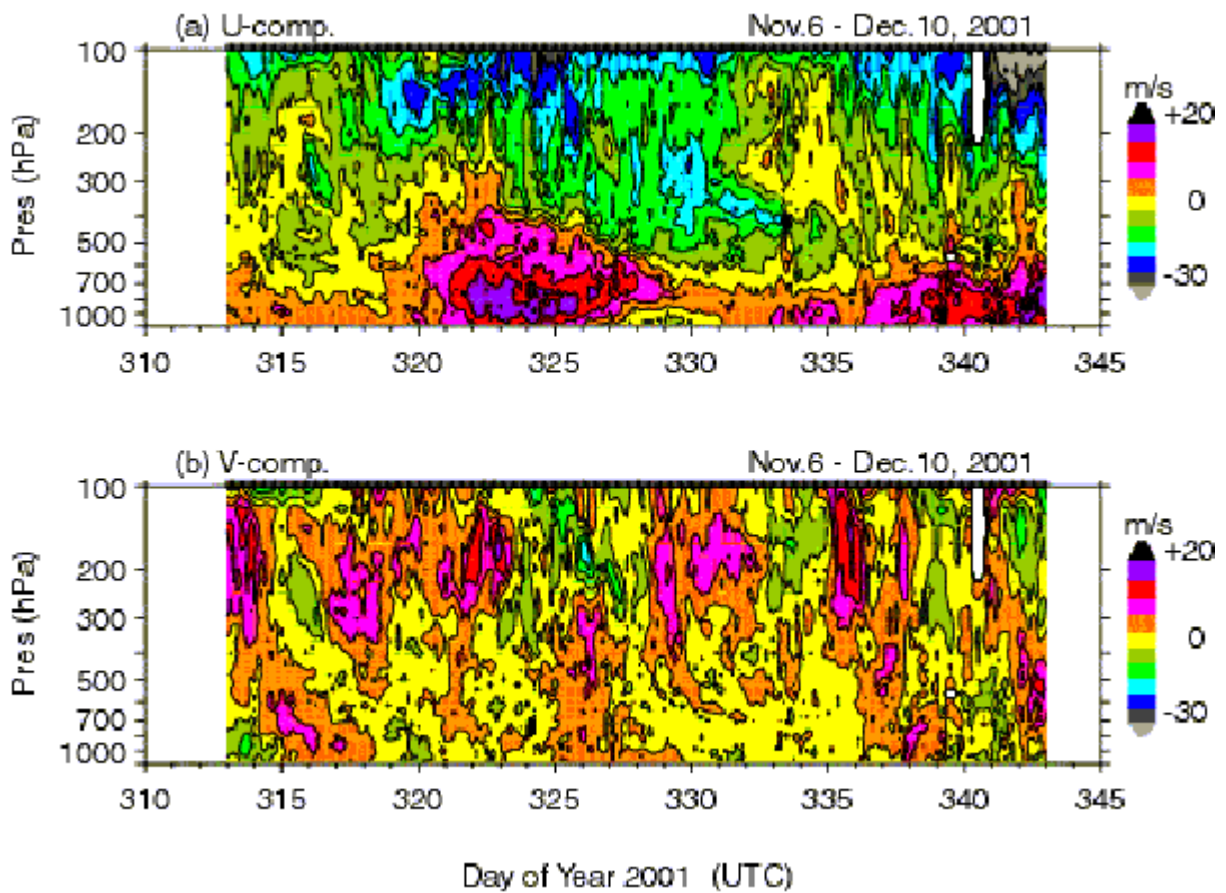


Fig.2 Time-Height cross sections of (a)zonal and (b)meridional wind components obtained by radiosonde conducted every 3 hours from 0000UTC, November 9 through 0000UTC, December 9.