

EAR-RASS、x帯降雨レーダー、降雨量データを用いた西スマトラ域の降雨雲形成に関する研究

Rain Formation observed with EAR-RASS, X-band meteorological radar and other instruments over west Sumatera

Ina Juaeni¹, 古本 淳一^{2*}, 津田敏隆², Bambang Siswanto¹, Martono¹, Nurzaman¹, Farid Lasmono¹, Eddy Hermawan¹
Ina Juaeni¹, FURUMOTO, Jun-ichi^{2*}, Toshitaka Tsuda², Bambang Siswanto¹, Martono¹, Nurzaman¹, Farid Lasmono¹, Eddy Hermawan¹

¹ インドネシア航空宇宙庁, ² 京都大学生存圏研究所

¹National Institute of Aeronautics and Space (LAPAN), ²Research Institute for Sustainable Humanosphere, Kyoto University

The high-temporal-resolution measurement of three dimensional wind velocities, temperature and rain intensity is very important to unveil mechanism of convective activity in the Equatorial region. Kototabang (KTB) in West Sumatera, Indonesia is one of the most ideal observational location to study these phenomena, because various atmospheric instruments to measure such parameter are installed almost over one of the most convective region. This study focuses on clarifying the behavior of convective activity statistically, and to elucidate the effect of meso-scale convective activity on the generation of localized rain at KTB.

In three EAR-RASS campaign periods (2 to 28 November 2002, 10 April to 5 May 2004 and 10 November to December 9, 2005), EAR was continuously operated in RASS mode to measure virtual temperature and three dimensional wind velocities with the temporal and height resolution of a few minutes and 150 m, respectively. From the data of precipitation echo and wind velocity, the effect of the localized circulation due to the topography of KTB on the convection is very small, and most of rainfall event are due to meso-scale convective activities. Meso-scale rain clouds were firstly formed windward from KTB, and the decaying rain cloud, which brings rainfall over ~30 mm/hour, frequently passed over KTB. From the EAR-RASS data it is found that the passage of raincloud was well correlated with the variance of virtual temperature, although the correlation with the zonal and meridional wind velocities is not recognized. The weather radar reflectivity at 2 km did not well correspond to the rainfall data on the ground. This result suggests that the strong clouds exists below the height of 2 km.

キーワード: RASS, 降雨レーダー, 赤道域対流活動

Keywords: RASS, X-band meteorological radar, Convective activity in the Equatorial region