

Characteristics of precipitation systems associated with intra-seasonal variability observed with the EAR and rain radar

SHIBAGAKI, Yoshiaki^{1*}, KOZU, Toshiaki², SHIMOMAI, Toyoshi², HASHIGUCHI, Hiroyuki³, HAMADA, Jun-Ichi⁴, MORI, Shuichi⁴, YAMANAKA, Manabu D.⁴, FUKAO, Shoichiro⁵

¹Osaka Electro-Communication Univ., ²Shimane Univ., ³RISH, Kyoto Univ., ⁴JAMSTEC, ⁵Fukui Univ. of Technology

In the tropics, the dominant intra-seasonal variability with a period of 30-60 days is characterized by a large-scale convective system propagating from the eastern Indian Ocean to the western Pacific. When the ISV arrived at the mountainous region of western Sumatra, its structure and movement are suddenly changed owing to the organization of meso-scale convective system and topographic effects of Sumatra, while the evolution of meso-scale convective systems occurring over the mountainous region is strongly influenced by a low-level environmental wind associated with the ISV. In the present study, we investigated evolution features of meso-scale convective system and the associated wind behavior in relation to ISV phase, using the long-term (2002-2010) observational data of the equatorial atmosphere radar (EAR) and X-band rain radar at Kototabang over the mountainous region. In the analysis period, 110 convective events with diurnal cycle were observed within 30 km from the X-band rain radar. According to the duration and size of typical convection in each event, we classified organized convections into four convective types (long-lasting and short-lasting convective systems in meso-beta and gamma scale). In the presentation, we will describe the development and organization mechanism of each convective type in relation to the low-level environmental wind of ISV and local circulation over the mountainous region of west Sumatra.

Keywords: Equatorial Atmosphere Radar, Convective system, Intra-seasonal variability