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Videosonde observations of tropical precipitating clouds developed over the Sumatera Island, Indonesia

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During November-December 2015, as a pilot study of the Years of the Maritime and Continent (YMC), a campaign observation over the southwestern coastal land and adjacent sea of Sumatera Island, Indonesia was carried out to examine land-ocean coupling processes in mechanisms of coastal heavy rain. Our videosonde observations were conducted as a part of this campaign for the better understandings of microphysical features in tropical precipitating clouds developed over the Sumatera Island. Videosonde is one of strong tools to measure hydrometeors in clouds directly. It is a balloon-borne radiosonde that acquires images of precipitation particles via a CCD camera. The system has a stroboscopic illumination that provides information on particle size and shape. One of the advantages for the videosonde is to capture images of precipitation particles as they are in the air because the videosonde can obtain particle images without contact. Recorded precipitation particles are classified as raindrops, frozen drops (hail), graupel, ice crystals, or snowflakes on the basis of transparency and shape. Videosondes were launched from BMKG Bengkulu weather station (3.86ºS [U+FF0C] 102.3ºE). After the launch of a videosonde, the Range Height Indicator (RHI) scans by a C-band dual-polarimetric radar installed on R/V Mirai, which was approximately 50 km off Sumatera Island, were continuously performed, targeting the videosonde in the precipitating cloud. Eighteen videosondes were launched into various types of tropical precipitating clouds during the Pre-YMC campaign.