



Convections and lightning activities over the southwestern coastal area of Sumatra Island, Indonesia, observed during the Pre-YMC 2015 and YMC-Sumatra 2017 campaigns

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We carried out two campaign observations over the southwestern coastal land and adjacent sea of Sumatera island, Indonesia, during November-December 2015 (pre-YMC 2015, hereafter Y15) (49 days) and November 2017-January 2018 (YMC-Sumatra 2017, hereafter Y17) (61 days). We deployed two land observation sites in Bengkulu city in the southwestern coast of Sumatra Island with various kinds of instruments including automatic weather stations and an X-band dual polarization radar as well as an operational C-band Doppler radar managed by BMKG, and the R/V Mirai over the coastal sea of Mentawai Strait with a C-band dual polarization radar. In addition, intensive 3-hourly soundings both over the land and the vessel were conducted during the both periods. Synoptic conditions during the Y15 (Y17) corresponded to El Niño (La Niña) and largescale cloud areas of active Madden-Julian Oscillation (MJO) passed over Sumatra Island in the about later (former) 10 days of the period, i.e. most of the both campaign periods were convectively MJO inactive phases. Period averaged rainfall amounts at Bengkulu site during the Y17 was 12.4 mm/day which was approximately 20 % smaller than that during the Y15 (15.9 mm/day) though the both periods corresponded to mostly MJO inactive phases. Rainfall diurnal variation in the Y17 was quite unclear and its peak time delayed approximately 2 hours in comparison with those in the Y15. In addition, although thunderstorms, which lasted for several hours every time, were observed everyday (31 days) during the Y15 until MJO active phase onset over Sumatra island, however those during the Y17 were reported quite few (9 days) and only a short time within an hour. Characteristics which brought different convective activities between two campaign periods, e.g., diurnally developed local winds, instabilities in the atmospheric boundary layers, and spatiotemporal variations of radar echo distribution, were analyzed for further discussion.