JAkarta Heavy precipitation Experiment (JAHE), a new Kakenhi-based field study on the IMC coastal hydrological cycle climatology

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Tropical "land-sea boundary zones" defined as areas of a few hundreds km between coastlines work as a "dehydrator" in the hydrological circulation which squeeze out water vapor from the atmosphere (e.g., Ogino et al. *JC2016*, *GRL2017*). In particular, the Indonesian maritime continent (IMC) dehydrate water vapor quite efficiently and bring the largest amount of precipitation on the earth because the IMC consists of various sizes of islands along the equator with long and complex coastlines. Jakarta, the capital city of Indonesia and as the largest coastal megacities in the southeast Asia, has suffered from large floods by coastal heavy precipitation which damaged social and economic activities seriously in the metropolitan area. Previous studies suggested that an interaction among the cross-equatorial northerly surge (CENS), MJO, and diurnally developed local circulation plays important role to generate heavy precipitation over Jakarta based on case studies (e.g., Wu et al. *SOLA2007*, *SOLA2013*). In addition, spatiotemporal variation of diurnally developed convections over Jakarta and their relation to land-sea circulation were clarified based on a campaign observation named HARIMAU2010 (Mori et al. *PEPS2018*) and their thermodynamic budget were examined in detail (Katsumata et al. *PEPS2018*), however hydrometeorological processes of the coastal heavy precipitation have not been well understood because the campaign period was only one month long.

We will launch a new field study (JFY2019-2022) to examine spatiotemporal variations of rainfalls, precipitating clouds, and water vapor, which must be essential components of coastal "dehydrator", over Jakarta from diurnal to intraseasonal, seasonal, and interannual time scales based on a mesoscale observation network deployed over Jakarta as well as data obtained operationally. Furthermore, we will improve a non-hydrostatic numerical atmospheric model which expresses skyscraper buildings, land cover change, and artificial heat exhaust in the downtown Jakarta to examine effect of urbanization on the coastal heavy precipitation.