[EE] Evening Poster | A (Atmospheric and Hydrospheric Sciences) | A-AS Atmospheric Sciences, Meteorology & Atmospheric Environment

# [A-AS04]Towards integrated understandings of cloud and precipitation processes

convener:Kentaroh Suzuki(Atmosphere and Ocean Research Institute, University of Tokyo), Yukari Takayabu(Atmosphere and Ocean Research Institute, the University of Tokyo), Hirohiko Masunaga
Tue. May 22, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)
Clouds and precipitation are among the largest uncertainties in weather predictions and climate projections. To overcome this difficulty, substantial progresses are required in understandings of cloud and precipitation processes and their interactions with large-scale environment. Such progresses, however, have been hampered by historical separation of the science community into two, namely, one for clouds and the other for precipitation, despite the fact that clouds and precipitation are inseparable phenomena.
This session aims to integrate various studies of clouds and precipitation across the two communities over different spatial and temporal scales. A particular focus is placed on better understandings of fundamental processes governing the cloud and precipitation phenomena and their multi-scale interactions with environment through dynamical, thermodynamical and radiative processes. A wide variety of studies with theoretical, modeling and observational approaches are solicited in this session to seek a novel way for combining different methodologies to obtain unified, holistic understandings of the cloud and precipitation systems. The solicited area of research includes but is not limited to cloud microphysics, cloud-radiation interaction, convection dynamics, meso-scale phenomena and various multi-scale interactions including tropical aggregation of clouds, by means of a breadth of approaches encompassing in-situ and satellite observations, theoretical process studies and numerical modeling. Through discussion of presented papers, the session is also intended to enhance collaborations among different disciplines and communities for substantially advancing our understandings of cloud and precipitation processes.

# [AAS04-P11]Possible signs of convective self-aggregation in satellite and in-situ observations

Toshiki Kadoya[1], *Hirohiko Masunaga[1] (1.Nagoya University)
Keywords:Tropical meteorology, Convective self-aggregation

In this study, possible observational evidence for convective self-aggregation is sought in the infrared imagery from the Meteosat-7 satellite and the sounding-array measurements from Cooperative Indian Ocean experiment on Intraseasonal variability in the Year of 2011 (CINDY2011)/Dynamics of the Madden-Julian Oscillation (MJO) (DYNAMO)/Atmospheric Radiation Measurements (ARM) MJO Investigation Experiment (AMIE). A new observational measure, or the morphological index for convective self-aggregation (MICA), is developed to objectively detect the signs of self-aggregation on the basis of a simple morphological diagnosis of convective clouds in the satellite imagery. The precipitation peaks during the observational period are first classified by MICA into aggregation events and non-aggregation events. The large-scale thermodynamics implied from the sounding-array data are then examined with focus on the difference between the two classes. The composite time series show that a significant drying and an enhancement of radiative cooling proceed over 12-24 hours as precipitation intensifies in the aggregation events. These features are absent in the non-aggregation events although precipitation is virtually equal between the two classes before and during the peak. The moisture budget balance is

maintained in very different manners between the two adjacent sounding arrays for the aggregation events, in contrast to the non-aggregation events which lack such apparent asymmetry. These results are consistent with the previous findings on convective self-aggregation, although the present work finds the self-aggregation features proceed on a shorter time scale than typically argued in the literature.