The South China Sea Two-Island Monsoon Experiment (SCSTIMX)

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Overview:
SCSTIMX is designed to study the interaction of convection over the MC-SCS with large-scale flow, by deploying observation platforms in the SCS as well as performing numerical modeling.

Observations:
Two types of observational tasks will be carried out by PIs in Taiwan's universities. The first is intensive observation during the periods (IOPs: Dec. 2017 – Jan. 2018; May-June, 2018) at Taiping Island and Dongsha Island, and the second is extended observation during the periods (EOP: Aug.-Oct. 2018), in coordination with the international projects, "Propagation of Intra-Seasonal Tropical Oscillations" (PISTON) and "Years of the Maritime Continent" (YMC). During the winter IOP (Dec. 2017 – Jan. 2018) and the summer IOP (May-June, 2018), Surface Weather Station, Ceilometer, Microwave Radiometer, Wind Profiler and intensive balloon soundings will be set off at Dongsha Island and Taiping Island (4 times a day), along with soundings at the southern part of Taiwan and countries around the SCS and MC regions. In addition, we also plan to carry out missions of target-aiming jet aircraft dropsondes and unmanned aerial vehicle (UAV aerosonde). A couple series of flight will be deployed in Central Weather Bureau (dropsonde) and in Taiwan Typhoon and Flood Research Institute (TTFRI, Aerosonde) during the IOPs to obtain environmental parameters over an expanded area between Taiping Island and Taiwan. We also propose to set up cloud and precipitation radars at Taiping Island supersite in the IOPs. These can be a relocation of the MOST TEAM radar/or NTU X-band dual polarization radar. These radars will be operated in conjunction with the microwave rain radars and/or ceilometers nearby when there are mesoscale convective systems approaching the site, to obtain a more complete monitoring of the cloud microphysics, convection structure, and precipitation intensity. During the EOP (Aug.-Oct., 2018), data will be measured regularly by surface weather station, boundary layer wind profilers, and upper-air balloon sounding.

Remarks:
To prepare for the field observations, we have conducted two pre-experiments. One was completed during December 11-21, 2016, through the research cruise from Kaohsiung to Taiping Island by the NTU RV OR1 voyage 1156. The cruise took place during the La Nina phase following the warm winter of 2015/2016 El Nino/Southern Oscillation (ENSO) event. The equatorial eastern and central Pacific was about 0.5-2 C colder than the climate mean. The second pre-experiment was completed during May 12 –June 12, 2017. The climate background was close to normal climate condition. Accompanied by the climate background, synoptic and intraseasonal oscillations in the SCS and surrounding warm oceans are analyzed and numerical simulations are made to explore the multi-scale interaction processes.
The observations collected during the SCSTIMX will provide valuable observations for both convective systems and large-scale events to be used by six projects funded to support the SCSTIMX observations.