

# **Investigation of Transport Processes Associated with the Asian Summer Monsoon Circulation using Balloons, Lidars, and Aircrafts – Collaboration with the ACCLIP**

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The Atmospheric Composition and the Asian Monsoon (ACAM; <http://www.igacproject.org/activities/ACAM>) is an international joint activity of IGAC (International Global Atmospheric Chemistry) and SPARC (Stratosphere-troposphere Processes And their Role in Climate), focusing on the following four research themes in the Asian Monsoon region: Emissions and air quality; aerosols and clouds; convection and chemistry; and response of the Upper Troposphere and Lower Stratosphere (UTLS) to the Asian Monsoon.

As one of the ACAM related large-scale international field campaigns, the Asian Summer Monsoon Chemical and Climate Impact Project (ACCLIP; <https://www2.acom.ucar.edu/acclip>) is being planned primarily by the US researchers in the summer of 2020 by using two US research aircrafts based on Okinawa and several other instruments and platforms. It is well known that the Asian Summer Monsoon (ASM) circulation is a planetary-scale, rather isolated airmass in the UTLS in the boreal summer, which contains high concentration of various pollutants of surface origin from China, India, and Southeast Asian countries. The ASM circulation exhibits distinct intra-seasonal variability, including large-scale eastward shedding vortices passing through the Japanese archipelago, with the frequency of about three times per month during the summer. Measuring the airmass of these eastward shedding vortices over Japan enables us to study the long-range transport and chemical processes of airmass originated from the Asian Monsoon countries.

In this presentation, we will introduce the research plan of the ACCLIP-Japan team with Japan-based researchers, which includes balloon measurements of trace gases, lidar measurements of aerosol particles, and the CONTRAIL (Comprehensive Observation Network for TRace gases by AIRliner) passenger aircraft measurements of trace gases, as well as studies using global models and dynamical and chemical reanalysis data sets.