

The stratosphere and troposphere exchange experiment over Asian summer monsoon (STEAM) Project

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During Northern Hemisphere summer, the Asian summer monsoon (ASM) anticyclone plays an important role to effectively transport tropospheric air into the lower stratosphere. The stratosphere and troposphere exchange experiment over Asian summer monsoon (STEAM) is a five-year field campaign project sponsored by Chinese Academy of Science (CAS) to improve the understanding of the chemical and dynamical processes in the upper troposphere and lower stratosphere (UTLS). Ground based lidar systems, research soundings, stratospheric balloons and unmanned aircraft will be conducted to measure the vertical distribution with sounding water vapor, ozone, aerosol, Aircore measurement of CH₄, CO, CO₂ in Tibetan Plateau, Inner Mongolia, and other stations from 2018 to 2021. Total column of trace gases mixing ratio will also be measured using coincident ground-based spectrometers, such as EM27, Pandora etc. The STEAM project will launch more than 50 soundings each summer, which will acquire a new dataset for the validation of satellite data, such as TROPOMI, GOSAT, OCO-2 and TanSat. The comprehensive remote sensing and in-situ observation dataset from STEAM project will be interpreted with several kinds of model simulations.