



## **Observations of ice-clouds from deep convective outflow during the Asian monsoon**

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The StratoClim field campaign was carried out using the Russian high-altitude aircraft M-55 Geophysica and took place during the monsoon season during July and August 2017 in Nepal. A total number of 8 flights ( $\approx 30$  flight hours) were carried out within the Asian Monsoon Anticyclone (AMA) over Nepal, India and Bangladesh, reaching up to altitudes of 20 kilometers thereby. A set of 5 different underwing cloud probes (including a holographic device) covers a particle size diameter range from  $2.5\mu\text{m}$  –  $6400\mu\text{m}$  (time resolution: 1Hz, uncertainty of number concentrations  $\approx 10\%$ ). We present data of size distributions and number densities for ice particles sampled during approximately 7 hours of cloud passes in the sub-tropical UTLS region above 200hPa.

During Flight 8 on August 10th the aircraft encountered an outflow event of a large convective system over northern India. As shown in the figure, combining results from the ice particle instruments and the carbon monoxide measurements from COLD (time resolution: 1Hz, sensitivity: 2 ppb, uncertainty: 6%), we see periods where increased cloud particle number concentrations (up to 10 particles per  $\text{cm}^3$ ) and elevated CO mixing ratios (up to 100 ppb) coincide. The observation of high CO mixing ratios is indicative for low level air carried aloft by deep convection. In the presentation the observed ice particle size distributions, their number densities and their shapes at the cold point tropopause are shown for pressure levels of around 85 hPa, and in particular from the region of the Asian Monsoon anticyclone.