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Measurements of SO_2, H2SO4 , NO, HNO_3, and NO_y in the Asian Summer Monsoon Anticyclone during StratoClim

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We present first results of SO_2, H_2SO_4, NO, HNO_3, and NO_y measurements in and above the Asian Summer Monsoon Anticyclone (ASMA) using the SIOUX and the new STRATOMAS instrument on board the Geophysica during the StratoClim campaign in Kathmandu, Nepal, in July/August 2017. The experimental techniques used include chemical ionization mass spectrometry (SO_2, H_2SO_4, HNO_3) and chemiluminescence (NO, NO_y). Profile measurements from 5 to 20 km altitude in the center of the ASMA will be presented. Several layers of enhanced trace gas mixing ratios were observed, originating from outflow of deep convection. Interestingly, we found also increased SO_2 mixing ratios above the cold point tropopause (CPT). For conditions with very low temperatures at the CPT, the mixing ratios of HNO_3 were depleted, probably due to HNO_3 uptake in particles. The H_2SO_4 observations in the lower stratosphere revealed significantly higher mixing ratios compared to previous balloon measurement at mid-latitudes. A first analysis of the origin of the distinct layers observed in the ASMA will be discussed.