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Results from a comparison of HCN measurements and Lagrangian backtrajectory analyses in the Asian Summer Monsoon Anticyclone

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The StratoClim aircraft field campaign took place from Kathmandu, Nepal, in summer 2017 in order to study the atmospheric composition, chemistry, and dynamics in the Asian Summer Monsoon Anticyclone (ASMA) which is known to transport surface emissions to the mid-latitude lower stratosphere and the stratosphere worldwide. Hydrogen cyanide (HCN) which is primarily emitted from biomass burning and has a UTLS lifetime on the order of 1-2 years is a good tracer for

biomass burning import into the lower and free stratosphere.

HCN in the ASM Upper Troposphere and Lower Stratosphere (UTLS) was measured in-situ employing the Chemical-Ionization Time-of-Flight Mass Spectrometer FUNMASS on board the high-altitude research aircraft M55-Geophysica. The observed HCN mixing ratios in and above the ASMA exhibit interesting vertical and horizontal signatures around the tropopause as well as in the LS probably resulting from convective activity or air mass origin (AMO). We here compare measured HCN to Lagrangian simulations by the ClAMS and TRACZILLA models which employ two different approaches to represent higher-reaching convective events. The simulations succeed to

track some of the observed HCN features back to convective activity or AMO. The quality of the reproduction and further outcomes on the atmospheric relevance will be discussed in the presentation.