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CLaMS simulations of aerosol transport from the Asian monsoon anticyclone into the extratropical UTLS

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The Asian Tropopause Aerosol Layer (ATAL) in the Northern Hemisphere during summer was first discovered in satellite observation of aerosol particles in the Upper Troposphere / Lower Stratosphere (UTLS) by Vernier et al. (2011; 2015). It is related to the Asian monsoon anticyclonic circulation at UTLS altitudes. Motivated by the current lack of detailed understanding of the origin of ATAL particles and the transport of aerosols from the Asian monsoon anticyclone into the extratropical UTLS, we propose a model study based on simulations with the three-dimensional chemical transport model CLaMS. Simulations will be performed for the Asian summer monsoon 2017. In the framework of the StratoClim project, an aircraft measurement campaign was conducted in Kathmandu (Nepal) in summer 2017. A variety of trace gases and aerosol characteristics have been measured for the first time in the Asian monsoon anticyclone up to 20 km altitude. By using artificial tracers of air mass origin (Vogel et al., 2015; 2016; 2019), we plan to analyze the transport of aerosol particles into the extratropical UTLS with the help of the new ERA-5 reanalysis data from ECMWF.