Are CCMIs reproducing the main features of the Asian Anticyclone ? What we can learn from the Stratoclim 2017 campaign

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A suite of diagnostics is applied to in-situ aircraft measurements, satellite observations and one Chemistry-Climate Model (CCM) data to characterise the structure of the Asian Anticyclone (AA) and the distribution of atmospheric tracers in the Upper Troposphere/Lower Stratosphere (UTLS) region. The diagnostics are based on dynamical variables to evaluate the evolution and dynamics of the AA, vertical tracer profiles and relative vertical tracer gradients, using tropopause-referenced coordinates, and tracer-tracer relationships in the Asian UTLS. Satellite data are used to bridge the local-scale given by aircraft observations to the state-of-the-art climate chemistry model EMAC. Observations are obtained during the recent M55 STRATOCLIM 2017 campaign that offers an unique and new data-set of high-resolution multi-parameter observations in the Asian Anticyclone region. The joint analysis and comparison of observed and modelled data allows to state o which extent the model can represent the background of Asian TTL structure and its variability rather accurately. Preliminary analysis shows that the model estimate of the thickness and vertical structure of the interface region between tropospheric and stratospheric regimes agrees well with average values inferred from observations. On the other hand, the measurements can be influenced by regional scale variability, local transport processes as well as deep convection, that can not be fully captured by the model.

Key words: Asian Anticyclone TTL, Chemistry Climate Models, Aircraft Campaign