



Comparison of Lagrangian estimates of cross-tropopause fluxes derived from different ECMWF data sets

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There is currently a debate on the quality of cross-tropopause flux estimates and their sensitivity to different meteorological data sets. Both analysis and forecast data can be used, differing with respect to their spatial and temporal resolution and the utilized data assimilation technique. In this study a Lagrangian analysis tool and a previously established method are used to identify locations and mass fluxes related with stratosphere-troposphere exchange (STE) events. The method is applied to a selected month of the ERA15 (OI, T106L31) and the ERA40 (3Dvar, T159L60) reanalysis data sets from the ECMWF. Additionally, a comparison is made between ERA40-reanalysis and the operational analysis and forecast data (4Dvar, T511L60) for a recent winter month.

The results of the comparison will be discussed focusing on geographical patterns, separately for upward, downward and net fluxes. The special category of so called deep exchange events will be considered as well. A detailed investigation of the appearing differences is undertaken aiming at tracing them back to the data types used for the calculation. The presented study will help to improve our knowledge of the accuracy of Lagrangian cross-tropopause flux estimates.