

Studies of the tropical tropopause region and polar ozone loss -- Two areas that are particularly sensitive on uncertainties in meteorological fields from data assimilation systems

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Gridded meteorological fields from data assimilation systems are the basis for a wide range of studies in atmospheric science. Based on examples from two regions in the atmosphere the presentation will show how such studies are affected by uncertainties in these products. (1) Polar ozone loss studies respond sensitively on just small uncertainties in temperature fields because the activation of chlorine species into ozone destroying radical forms is an extremely non-linear process, which is triggered by a threshold in temperature. The presentation will show the relation between calculated ozone losses and assumed biases in the temperature field and will discuss the robustness of such calculations in the presence of uncertain input data. (2) Uncertainties in the vertical wind fields from DA systems are often a limiting factor for stratospheric transport studies and in particular for studies of processes in the Tropical Tropopause Layer. Sparse time sampling in six hourly fields together with noise components or wave induced short term fluctuations can result in unrealistic diffusion dominated vertical transport of species in the presence of steep vertical gradients across the tropopause. Ways to deal with these limitations of DA data products in atmospheric process studies will be discussed.