



Simulation of the Diurnal Variation of Stratospheric Ozone

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We utilize the Whole Atmosphere Community Climate Model (WACCM) to model the diurnal variation of stratospheric ozone. WACCM is a state of the art chemistry climate model for the 3 dimensional, global atmosphere from the ground up to 140km. Similar to observational data, the model shows a maximum of ozone concentration in the stratosphere during the late afternoon at about 17 pm in the mid-stratosphere at about 5 hPa. The maximum appears all-season - almost over the entire globe with different amplitudes depending on latitude. In order to study the origin and the extend of the afternoon ozone peak, the model is tweaked to provide detailed chemical data. According to model data, the diurnal variation of ozone in the stratosphere is mainly governed by the Chapman Cycle and the catalytic ozone depletion cycles governed by NO and ClO. Underlying processes are sensitive to the net ozone concentration. This sensitivity to profiles can be shown e.g. for NO_x in sensitivity studies. We investigate and discuss if the dependences of the daily ozone cycle on the geographic location are due to regional changes of the atmospheric composition.