



The seasonal cycle of ozone in the lowermost stratosphere from CMAM and ozonesondes

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The Canadian Middle Atmosphere Model (CMAM) is a vertically extended (lid at ~ 95 km) version of the third-generation Canadian GCM, including a radiatively-interactive representation of stratospheric chemistry. The CMAM has been extensively used to study the past evolution, and produce future projections, of stratospheric ozone, notably through participation in model intercomparisons within the Chemical Climate Model Validation (CCMVal) project. The CMAM has recently been extended to include a basic representation of the chemistry of the troposphere. While only the chemistry of methane- NO_x is considered for the troposphere, along with associated processes such as emissions and dry and wet deposition, the distribution of ozone produced by the model compares well with ozonesonde records. Here the seasonal cycle of ozone in the upper troposphere and lowermost stratosphere (between the tropopause and potential temperature 400K) derived from ozonesondes is compared with CMAM. The general features of the annual cycle of ozone as a function of potential temperature are captured by CMAM, displaying the seasonally varying importance of stratospheric and tropospheric influences on air in the lowermost stratosphere. In particular the CMAM captures a large degree of the variability in ozone on potential temperature surfaces associated with isentropic transport, though the CMAM does overestimate the amount of ozone at higher values of potential temperature over high northern latitudes. Implications for stratosphere-troposphere exchange are discussed.