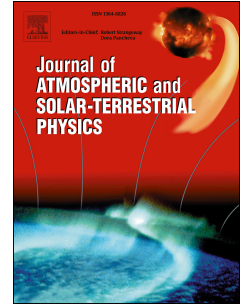


# Accepted Manuscript

Nighttime mesospheric ozone enhancements during the 2002 southern hemispheric major stratospheric warming

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1 Nighttime mesospheric ozone enhancements during the  
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16 **Abstract**

Sudden Stratospheric Warmings (SSW) affect the chemistry and dynamics of the middle atmosphere. Major warmings occur roughly every second winter in the Northern Hemisphere (NH), but has only been observed once in the Southern Hemisphere (SH), during the Antarctic winter of 2002. Observations by the Global Ozone Monitoring by Occultation of Stars (GOMOS, an instrument on board Envisat) during this rare event, show a 40 % increase of ozone in the nighttime secondary ozone layer at subpolar latitudes compared to non-SSW years. This study investigates the cause of the mesospheric nighttime ozone increase, using the National Center for Atmospheric Research (NCAR) Whole Atmosphere Community Climate Model with specified dynamics (SD-WACCM). The 2002 SH winter was characterized by several reductions of the strength of the polar night jet in the upper

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