

## Impacts of stratospheric sudden warming events in the mesosphere and lower thermosphere

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Impacts of stratospheric sudden warming (SSW) events on the middle and upper atmosphere have been widely recognized. However, due to an insufficient number of global observations, SSW's effects on the general circulation in the mesosphere and lower thermosphere (MLT) are not well known. In this study, we investigate the short term variation of the temperature, zonal wind and meridional wind in the MLT region during SSW events using a general circulation model that contains the region from the troposphere to the thermosphere. We conducted GCM simulation with meteorological reanalysis data during the period from November 1, 2008 to March 31, 2010. Our results show that the temperature drop occurs in the Southern hemisphere, during SSW events. This means that SSW influences the general circulation in the summer hemisphere. Furthermore, it is found that the temperature in winter polar region in the lower thermosphere increases during SSW events. This is related to upward propagation of the planetary wave excited in the mesosphere.

Keywords: stratospheric sudden warming, mesosphere, lower thermosphere