

# Effects of solar proton events on ozone and temperature in the latest reanalysis data

Yoshihiro Tomikawa<sup>1,2</sup>

<sup>1</sup>*National Institute of Polar Research*

<sup>2</sup>*The Graduate University for Advanced Studies, SOKENDAI*

Solar proton events (SPEs) have some impacts on the middle atmosphere through NO<sub>x</sub>/HO<sub>x</sub> formation, its subsequent ozone destruction, and Joule heating. Several observational and simulation studies have reported their impact on ozone, temperature, and circulation in the middle atmosphere. However, their impact has never been captured in the meteorological reanalysis data. The latest meteorological reanalyses have been developed to assimilate satellite radiance and ozone observations in the upper stratosphere and lower mesosphere, so that they have a potential to reproduce atmospheric impacts of SPEs. This study examines whether the SPEs' impacts on ozone and temperature in the middle atmosphere can be captured in the latest reanalysis data or not.