

## A comparison of the momentum budget in reanalysis datasets during sudden stratospheric warming events

\*Patrick Martineau<sup>1</sup>, Seok-Woo Son<sup>2</sup>, Masakazu Taguchi<sup>3</sup>, Amy Butler<sup>4</sup>

1. UCLA, 2. Seoul National University, 3. Aichi University of Education, 4. NOAA/CIRES

The agreement between reanalysis datasets is evaluated during sudden stratospheric warming (SSW) events using the zonal-mean momentum budget. Zonal-mean variables reveal a good agreement among datasets for the fast warming and weakening of the polar vortex in the lower stratosphere. Eddy fluxes and forcings for zonal-mean zonal wind acceleration are also relatively similar in the lower atmosphere. This agreement is, however, severely degraded in the mid-to-upper-stratosphere. Discrepancies among reanalyses are particularly large during the onset of SSW events, a period characterized by unusually strong fluxes of planetary-scale waves from the troposphere to the stratosphere, and are substantially smaller after the onset. The discrepancies are also typically larger for the most intense SSW events. While the largest uncertainty in the momentum budget originates from the Coriolis torque, momentum flux convergence also presents a non-negligible spread among the reanalyses. The uncertainty of all terms of the zonal-mean momentum equation among reanalyses is reduced in the latest reanalysis products.