



On the longitudinal variability of the mean age of stratospheric air and the polar vortex preconditioning

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Using three-dimensional (3D) fields of the mean age of stratospheric air (AoA) from the Canadian Middle Atmosphere Model (CMAM) as a 3D transport diagnostic, we study a role of the spatiotemporal gravity wave activity distribution for the middle atmospheric circulation and longitudinal variability of the Brewer-Dobson circulation. Further we make use of the fact that AoA reflects the cumulative effect of transport processes and study its potential to act as a vortex preconditioning proxy with a possibility to enhance the predictability of polar vortex events. For this case we created composite analysis of sudden stratospheric warming events from the CMAM specific dynamics simulation and focus on the full 3D fields and AoA distribution anomalies. The dynamical origin of these anomalies is then analysed with respect to the anomalous planetary and gravity wave activity.