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Periodicities in modeled ozone column and hydroxyl radical in the lower atmosphere

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Hydroxyl radical is the major oxidizing agent of the lower atmosphere playing a major role in gas phase chemical oxidation. Monthly mean tropospheric and stratospheric hydroxyl radical (OH) concentrations over 10 degree latitude zones over the northern and southern hemispheres were analysed from the Oslo chemical transport model (CTM2) simulations at 2.8x2.8 degree resolution. The period studied were from January 1998 to December 2011 (14 years x 12 months = 168 monthly data). The semi-annual to annual QBO and longer-term variations are reflected in the Oslo CTM2 modeled tropospheric OH. The periodic variation in OH in the tropical troposphere is in opposite phase to the variation in total ozone imposed by QBO impact in the stratosphere.
QBO type periodicity in tropospheric OH is most pronounced at low latitudes with amplitudes of +4% to -4%. Going from low-to mid- latitudes there is a clear phase shift in the QBO impact on total ozone.
Furthermore, we find that modeled OH is well correlated with ground-based UV-B measurements at various stations.