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Response of Middle Atmospheric Hydroxyl Radical to the 27-Day Solar Forcing

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In this study, we use the Microwave Limb Sound (MLS) data to examine the response of middle atmospheric hydroxyl radicals (OH) to the 27-day solar rotational variability during the solar maximum activity year (2004–2005). The results are compared to the simulations of the 1-D photochemical model KINETICS using different UV variabilities. *Shapiro et al.* [*Atmos. Chem. Phys.*, *12*, 3181–3188, 2012] have examined the 27-day solar cycle modulation in tropical mesospheric OH measured by MLS, and found that the OH 27-day solar response is 1% per 1% change in Lyman-α at 80 km. However, as different band-pass filter is applied, the OH response varies significantly. An optimal filter is selected based on the convergence of OH response with respect to filter window size. The results show that in the middle atmosphere model simulations underestimate the hydroxyl radical variabilities to short term solar forcing by 20%–50%.