

Interactive comment on “Modelling the residual mean meridional circulation at different stages of stratospheric warming events” by Andrey V. Koval et al.

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Dear Pavel Vargin! Thank you for you for your interest in our manuscript. We think that stratospheric warmings have many reasons. For example, enhanced planetary waves frequently observed before SSWs may not only modify the residual meridional circulation, but also may increase Eliassen-Palm fluxes directed to the North Pole and heating the polar stratosphere. In the present study we selected only three time intervals (before, during and after simulated SSWs), which is not enough for the detailed analysis of time evolution of different SSW factors in time. Probably, such studies will require increasing in the number of the model runs. However, we agree that the result about

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enhancing downward fluxes in SSW regions is interesting and requires further studies. About therm "SW" and "SSW": the model dates or simulated warming events were obtained using the definition by Charlton and Polvani (2007). However, we detected zonal wind reversals at every MUAM run not only at pressure level of 10 hPa (near 30 km altitude), as it was proposed in the conventional definition but also at higher altitudes up to 50 km. To differentiate these phenomena from traditionally considered SSWs near 10 hPa pressure level, we decided to call them simply as "stratospheric warmings" (SWs). To avoid further confusion, we will correct the terminology if the reviewers also support your opinion.

Charlton, A.J., Polvani, L.M.: A new look at stratospheric sudden warmings. Part I: Climatology and modelling benchmarks, *J. Clim.* 20, 449–469, 2007.

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