

Reply #2

to the Reviewer #2 of the paper by Koval et al. "Modelling the residual mean meridional circulation at different stages of sudden stratospheric warming events"

We would like to thank the Anonymous Referee #2 for useful comments and suggestions. We considered all of them and added all the necessary edits to the revised manuscript. Our answers are given below in the italic font.

L 8. The

Corrected

L. 27 in the troposphere the Hadley and Ferrel cells provide the meridional circulation. What do you mean with BDC in the troposphere?

The sentence was edited. About the Hadley and Ferrel cells there is a comment at the line 148

L.120 Please give complete info also in Figure caption! (SSW, HSW etc.)

Figure caption was edited.

L. 136 v' and θ' have been defined already above; (3) and (4) follow just by calculus

Corrected

L. 145 It looks like that the streamlines in Fig2 do not really correspond to the wind vectors (higher density of streamlines when wind is stronger.

Strange behavior of GRADS when forming panels with streamlines. To avoid misunderstanding, we decided to remove these panels and to leave only figures with vectors. They show the circulation structure more clearly.

L. 294 Please be consistent with definitions of quantities in equations (1) (2).

Definitions of quantities are brought to uniformity.

Reply #2

to the Reviewer #3 of the paper by Koval et al. “Modelling the residual mean meridional circulation at different stages of sudden stratospheric warming events”

We would like to thank the Anonymous Referee #3 for useful comments and suggestions. We considered all of them and added all the necessary edits to the revised manuscript. Our answers are given below in the italic font.

The authors have improved the article considerably by better stratifying their description of the several aspects of the changes of the RMC and related fields under SSW events.

However, I would suggest changing the last subsection title from “Conclusion” into “Summary”, because this is primarily a descriptive paper. The work describes processes in the middle atmosphere, which are worth to know but I do not see any conclusion to be drawn from. If there is any, it would be good to highlight it.

We changed the last subsection title to “Summary” and added a concluding remark at the end of the subsection.

Minor issues are

L89 “forcing at low”ER boundary

Corrected

L114: please include the given explanation in the figure caption as well

The explanation included

L 178: “which general structure” => change to its general structure

Corrected

L 179: “residual meridional velocity in Figure 2a1 exist”: is it perhaps Figure 3?

Corrected

L 193: “The contours at the left and right panels of Figures 1” => figure1 of Figure 3? Please be more explicit on that

This sentence is about Figure 1. We reformulated this part to be more explicit and clear.