Atmos. Chem. Phys. Discuss., 12, C5282–C5283, 2012
www.atmos-chem-phys-discuss.net/12/C5282/2012/

Atmospheric Chemistry and Physics Discussions

Interactive comment on "Influence of a Carrington-like event on the atmospheric chemistry, temperature and dynamics" *by* M. Calisto et al.

Anonymous Referee #3

Received and published: 2 August 2012

Presented paper is devoted to the simulations of atmospheric response to Carrington-like event. 3D model SOCOL was used for this study. Authors understand that Carrington event really not observed in the most ice core nitrate records, nevertheless, the results are presented in hope that it will be useful for understanding of future very strong SPEs response.

It was supposed by the authors, that simulated event is similar to the August 1972 event with a similar energetic spectrum, but increased proton fluxes, in accordance with supposed features of Carrington event publishes in different papers and listed by the authors.

It seems that presented effects for the middle atmosphere look very similar to other strong and calculated observed SPEs in spite of increased proton fluxes used by the authors in model runs. (such similarity needs special comments inside presented paper).

It seems also that calculated changes of zonal wind (increased) need additional attention. As was published before (Krivolutsky et al, ASR'2006), and devoted to strong SPE of July 2000, such difference may depends on the sign of basic zonal wind. When the absolute values of zonal wind were used in mentioned paper the difference became negative.

It's looks important to find rather strong temperature changes in the lower atmosphere (different for Northern and Southern polar regions). It would be well to have more detailed explanation related to this result.

Paper may be published after a look of the authors on these comments.

Reference

Krivolutsky et al, Dynamical response of the middle atmosphere to solar proton event of July 2000: Three-dimensional model simulations, Advances in Space Res., 37, 1602-1613 (2006)

Interactive comment on Atmos. Chem. Phys. Discuss., 12, 14747, 2012.