

## ***Interactive comment on “Ionization effect of solar particle GLE events in low and middle atmosphere” by I. G. Usoskin et al.***

**Anonymous Referee #3**

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### COMMENTS FROM REVIEWER

The paper “Ionization effect of solar particle GLE events in low and middle atmosphere” I. G. Usoskin, G. A. Kovaltsov, I. A. Mironova, A. J. Tylka, and W. F. Dietrich presents an interesting very useful application of CR11 model, namely calculation of ionization rates due to major GLEs. The ionization effect due to 20 Jan. 2005 major GLE deserves special attention.

The manuscript is well structured, the length of the paper is adequate, the presentation is clear and reaches the international standards, the size of figures is adequate and contains the necessary information.

The reviewer welcomes publication of the manuscript after minor revision and more

C13214

details given below:

Please compare or comment shortly the results presented in

Alexander Mishev, Peter Velinov, Lachezar Mateev Atmospheric ionization due to solar cosmic rays from 20 January 2005 calculated with Monte Carlo simulations, Comptes rendus de l'Académie bulgare des Sciences 63(11), 2010, 1635-1642 Replace everywhere in the text little with small (as example page 30383 line 3).

Page 30382 line 2 : new reconstruction what ?(method, data) please precise

Page 30384 line 23 Frobush is a missprint please correct

Page 30387 line 6 : Fluence is usually expressed for neutrons. In this case I think that flux is precise.

Page 30388 line 20. The same as previous

Please also note the supplement to this comment:

<http://www.atmos-chem-phys-discuss.net/10/C13214/2011/acpd-10-C13214-2011-supplement.pdf>

Interactive comment on Atmos. Chem. Phys. Discuss., 10, 30381, 2010.