**Atmospheric
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Comment

Interactive comment on "The impact of different nitrous acid sources in the air quality levels of the Iberian Peninsula" *by* M. Gonçalves et al.

Anonymous Referee #4

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General Comments

I agree with the arguments that were already raised by reviewers 1-3.

In my view the paper has little new to add to the discussion that is going on with respect to the importance of HONO for photochemistry. Moreover, it falls back behind the findings given in Vogel et al. (2003) and Sarwar et al. (2008). The paper of Aumont et al. (2003) should be considered an be added to the list of references.

The paper lacks from two major shortcomings. Firstly, it does not take into account photolytic sources of HONO which were suggested to be of great importance by previous studies (many of them are cited in the paper). Secondly, it does not contain any comparison of observed and measured diurnal cycles of HONO. It is hard to under-

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Interactive Discussion

Discussion Paper

stand what can be learned from a comparison of the modeled HONO concentration of a single day in June 2004 with averaged measured concentrations for a period in November-December 2008.

If the authors have data for that period they should perform model runs for that period.

Without doing that the paper describes a sensitivity study on HONO formation taking into account direct emissions of HONO and their heterogeneous formation at the surface. However, it might be that the study is still of interest as it shows the influence of relative humidity and that not only ozone concentrations but also the PM2.5 concentrations are sensitive to the additional HONO sources.

Minor comments: It would be very helpful for the reader if the abbreviations of the different model runs are more intuitive (Table 2).

Fig.3. The labels of the legend (colour code) are hard to read. Figure 3 (d) please change into ppt and modify the colour code to highlight the spatial pattern of HONO. What do you mean by 'concentrations estimated by'?

Figs. 4-10. The character size for axis and legend labels is too small.

Fig. 9. What are the units of the values that are shown? The colour code should be modified to depict the spatial pattern.

Fig. 10. What do you mean by 'estimated by'? Are the results of the model estimations? Are the units given in Figure 10 correct? Do you have any comparisons with observations?

The results shown in this figure are quite interesting. Especially the differences for Cangas are quite substantial. Nevertheless, this is hard to understand as no significant changes in nitrate were found (208205, line 4). What means no significant changes?

Interactive comment on Atmos. Chem. Phys. Discuss., 10, 28183, 2010.