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Interactive comment on "Observations of OH and HO_2 radicals in coastal Antarctica" *by* W. J. Bloss et al.

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The manuscript by Bloss et al. presents important data recorded at a remote site representative for large areas of the world where OH and HO_2 measurements are very sparse. The authors correlate OH concentrations vs. the photolysis rate of ozone, $j(O^1D)$, in order to show the prominent dependence of OH on radiation (Fig. 5). Similar exercises were done in a number of papers (e.g. Brauers et al., 2001; Holland et al., 2003; Rohrer and Berresheim, 2006). Brauers et al. present data in a remote, clean air environment and they provide further analysis of the correlation between measured OH and $j(O^1D)$ and modelled OH and $j(O^1D)$. Holland et al. present a detailed study of OH and $j(O^1D)$ at a continental site, while Rohrer and Berresheim analyze a long term OH and $j(O^1D)$ dataset and compare the slopes found to other environments

and model calculations. I think a thorough analysis of the correlation between OH and $j(O^1D)$ and the regression is needed and the following items should be addressed.

- How much of the scatter in Figure 5 can be attributed to the statistical error of the OH and $j(O^1D)$ measurements?
- What is the significance of the power law coefficient? Since r^2 is not a measure for the goodness of the fit, the *"chi-square"*, χ^2, should be used instead to judge the quality of the fitted function (see e.g. Press et al., 1992, for details).
- How does the slope and/or power law compare to other observations which were published?
- How does the model OH presented in Figure 7 correlate with $j(O^1D)$?
- The intercept of OH at $j(O^1D) = 0$ is significantly different from zero which is not expected in a clean environment like Antarctica. I think that this finding needs more explanation and clear statements about the LIF instrument's performance at low levels of OH.
- The information on the $j(O^1D)$ measurement is not very detailed. It would be helpful if the authors could provide a reference to the instrument, the ozone cross section, and the O^1D quantum yield (including the temperature dependence) used in this study. Is it possible to state the accuracy of the $j(O^1D)$ measurements?

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