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Interactive comment on "Aerosol lifetime and climate change" *by* G.-J. Roelofs

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This is an interesting paper that explores the relationship among water vapor, precipitation and aerosol lifetime as they are all related to the cloud parameters. Understanding aerosol lifetime associated with wet deposition is a crucial component to unravel the climate-cloud-aerosol interaction. Here, I would like to recommend a few technique corrections.

First, line 17-18 The wet deposition of the tracers in the GFDL model is determined by the ratio of precipitation rate and precipitable water (not just precipitation rate), as referred to both Donner et al., (2011 J Clim.) and Giorgi and Chameides (1985, JGR).

Second, line 22-23 The statement that "Fang et al. (2011) attribute the lifetime increase to a decreased precipitation frequency." is not consistent with the original conclusion of that paper (at least within the current context of this statement). The major reason

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for the lifetime increase in Fang et al.(2011) was attributed to decreases in Large-scale precipitation (the major driver of wet deposition in GFDL model) over polluted area during polluted seasons, while the impact of decreased precipitation frequency was more important in winter time.

Third, footnote b of Table 1 The GFDL model in Fang et al. (2011) is driven by 2100 A1B scenarios, not a double CO_2 scenario.

Interactive comment on Atmos. Chem. Phys. Discuss., 12, 16493, 2012.