**Interactive comment on “Lagrangian analysis of microphysical and chemical processes in the Antarctic stratosphere: a case study” by L. Di Liberto et al.**

Anonymous Referee #1

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The authors present a comprehensive analysis of a PSC observation based on in-situ balloon and lidar measurements. The microphysical and chemical evolution of the observed PSC was documented by satellite observation and air-mass trajectories. Finally the observations were compared to chemical and microphysical box model simulations.

The paper is of interest to the scientific community due to the comparison of observational data with model simulations. The results are valuable in the ongoing discussion regarding whether cold liquid aerosol (background) can explain most of the chlorine activation.

I only have some minor points that need to be addressed for clarification in the revised version of the paper.

- Satellite instruments: Can you please add the horizontal resolution of the MLS and MIPAS observations.
- Trajectories: Trajectories are shown between 350 and 460 K. However, the PSC was observed between 330 and 420K. Why the difference?
- Microphysical and optical model: page 32637, line 19-20: Can you please add studies that have used the model under those conditions.
- Chemical simulations: results are only shown for 400 K. However, the double overpass of the air-mass was between 380 and 420 K. Are the simulations robust for the entire altitude region?
Other minor comments: Figure 5, upper panel: altitude axis is partially covered.

Interactive comment on Atmos. Chem. Phys. Discuss., 14, 32629, 2014.