Answers to te co-editor and referees.

Co-editor: All technical corrections have been made on the revised manuscript.

Referee 1: All minor comments (M1-M5) have been addressed in the revised manuscript

Referee 2:

Abstract. The main focus of this work is to define diagnostics that permit to compare (CALIOP) observations with the models. It is obvious that, while comparing the different models, some show a better agreement than others for each diagnostic tool. We cannot avoid to mention this.

Comparison of PSC observations by ground-based and satellite based lidars.

All suggestions have been followed and the text has been changed accordingly and some phrases have been removed.

For what concerns the comparison between model simulations and CALIOP, we want to stress that we use model output of FREE RUNS. This implies that the output is not nudged, that means that we cannot compare year to year, and interannual comparison makes no sense.

Comparison of CALIOP PSC observations in the Southern Hemisphere with CCM simulations.

The phrase about the supersaturation was taken from Morgenstern (2010). However we did not find a clear explanation in this references, neither in the references in Morgenstern, so we decided to eliminate the sentence.

L10-11, p16. The sentence has been modified

L8-9 No

L10-11 The inconsistency has been removed

Caption table 5. The caption has been corrected

Table 5 vs Table 2. Please Note that Table 2 refers to the CALIOP observations inside the 7x2 degrees box centered on McMurdo, while Table 5 refers to the Southern Hemisphere

Conclusions. The primary goal is to develop diagnostics which allow to compare observations with CCM output. In the course of comparison one cannot avoid to discuss the degree of agreement between the individual models and the observations. It is obvious that the WACCM-CCMI model in most diagnostics compares well with the observations.

Technical corrections:

All corrections have been made in the revised manuscript

We thank the co-editor and both referees for their constructive remarks which have much improved the paper.