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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Persistence and photochemical decay of springtime total ozone anomalies in the Canadian Middle Atmosphere Model" *by* S. Tegtmeier and T. G. Shepherd

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Answer to Referee 1

General: We understand the reviewer's concerns. We have eliminated the phrase "robust, process-oriented diagnostic", which was perhaps too general, and tried to make it more clear what the diagnostic does and does not validate. Even if photochemistry is mainly what is being tested, models need a realistic transport to pass this test. Now the paper includes cases where the diagnostic helps to understand model deficiencies. Furthermore we linked the diagnostic to the estimation of long term changes in total ozone.

Specific issues: 1. We have replaced the previous time slice run with a more recent

45-year transient CMAM run (the REF1 run of Eyring et al., 2006 and WMO, 2006). Now the decrease is still a bit too weak but it is better than before. 2. The diagnostic assesses certain processes but not all processes. We have tried to make the logic of our analysis a bit clearer. 3. There is probably a confusion here. It is in the partitioning between polar and midlatitude anomalies that CMAM has problems in the northern hemisphere, something which is now shown to affect the behaviour of the long-term trends. The "realistic behaviour" refers to the ozone integrated over the whole extratropical region.

In summary: As noted above we have tried to address these issues by including cases where the diagnostic helps to analyze model deficiencies. We hope that the referee is satisfied with the outcome.

Interactive comment on Atmos. Chem. Phys. Discuss., 6, 3403, 2006.