Answer to the comments of Anonymous Referee #2: Validation of SCIAMACHY limb NO_2 profiles using solar occultation measurements by Ralf Bauer et al

January 9, 2012

General comments

As Referee #2 points out, the comments from Referee #1 are already rather complete. However, Referee #2 introduces some additional recommendations, which are adressed here.

The major new suggestion here is to also analyze differences in sunset/sunrise measurements. The scatterplots introduced as a result of Referee #1's comments contain linear regression parameters for sunset/sunrise measurements. The data points in the scatterplots are already identified by their latitudinal bin and adding further sunset/sunrise information would likely create unreadable plots. However, the diurnal effect error correction plots are also needed to be redone and these plots now also include sunset/sunrise differences.

Also, new averaged absolute profiles are plotted without sunrise/sunset difference to avoid obfuscated plots, while still giving the reader the chance to see the shape of the NO_2 profiles, possibly the altitude mismatch of NO_2 maxima, and also typical NO_2 levels in each latitude/seasonal bin.

Additional tables now provide more information: The latitude range of each investigated season is given in a table, while new overview tables now include more information, i.e. local times (SCIA), seasons, and number of collocations in each latitude/ seasonal bin.

Also, more literature information of the difference between the occultation instruments is included, as suggested.

P 4755, l12 . . . contribute to the NO2 loading (and not to ozone depletion) P 4769, l14. The SCIAMACHY error at low altitude is systematic. Fig1. Retrieval at 77.5N. At which season?

Since this is based on example retrievals, it is now given with the day of its measurement.