Dear Bastiaan van Diedenhoven,

Thank you for your interest in our work and for your constructive comments and corrections, which clearly help improve the quality and readability of our paper.
In the following, I respond to your comments on a point-by-point basis:

This paper describes an interesting study on the possibility to retrieve aerosol optical thickness and layer height from SCIAMACHY oxygen A- and B-band measurements. I would like to share three brief comments:
1) In noticed the paper van Diedenhoven et al. (2007) was referenced on page 6790, line 9, in relation to the correction factor applied to SCIAMACHY oxygen A-band measurements. However, that paper describes a method to retrieve cloud parameters applied to GOME measurements. The correction factor to SCIAMACHY oxygen A-band measurements was determined by van Diedenhoven et al. (2005) (see below).

I apologize for the mix-up. The references have been corrected now. We have cited your 2007 work in the following: "A quantitative analysis of retrieval errors caused by error in ground pixel representation through uncertainties in surface albedos for instruments like GOME (Burrows et al, 1999) and SCIAMACHY is provided by van Diedenhoven et al., 2007, indicating that errors due to representation of a given scene can far exceed the measurement error of the instrument."

2) In van Diedenhoven et al. (2005), we also discussed the possible decrease or enhancement of photon path lengths in the oxygen A-band owing to aerosol and the sensitivity thereof to aerosol optical thickness, aerosol vertical distribution and observation geometry. To provide the reader with some more insight on these competing effects on the light path due to aerosol, I suggest referring to this paper in the end of section 2 (from line 5, page 6786), where these effects are mentioned.

Thank you for drawing our attention to this. A reference has been added "A discussion on the competing effects of surface and aerosol within the A-band, taking into account the viewing geometry can be found in van Diedenhoven et al., 2005."

3) Finally, I would like to point out that the residuals obtained in the oxygen A-band, shown in Fig. 8, seem to resemble the residuals presented by van Diedenhoven et al. (2005). Moreover, they also seem to resemble the residuals obtained by van Dieden- hoven et al. (2007) after retrieving cloud parameters from GOME measurements in the oxygen A-band. As discussed by van Diedenhoven et al. (2007), the fact that similar residuals are obtained using two different instruments and with different retrieval procedures may indicate that many of the residuals result from errors in (HITRAN) spectroscopy or the assumed line shapes, or neglecting collision induced absorption in the forward model (Tran et al., 2006), rather than from errors in the aerosol model. The authors might want to elaborate somewhat more on the possible causes of the residuals on page 6791, where Fig. 8 is discussed.

This is a very valuable piece of information, and the authors are very glad you brought this to their attention. We have incorporated these references as: "Figure 9 shows a typical fit with a SCIAMACHY measurement. The residuals obtained in the oxygen A-band strongly resemble the residuals presented by van Diedenhoven et al., 2005. Moreover, they also resemble the residuals obtained by van Diedenhoven et al., 2007, after retrieving cloud parameters from GOME measurements in the oxygen A-band. As discussed by van Diedenhoven et al., 2007, the fact that similar residuals are obtained using two different instruments and with different

retrieval procedures may indicate that many of the residuals result from errors in spectroscopic parameters (Rothman et al., 2005) or the assumed line shapes, or from neglecting collision induced absorption in the forward model (Tran et al., 2006), rather than from errors in the aerosol model."