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Comparison of retrieved NO_3 vertical profiles from SCIAMACHY with 1-D model outputs

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NO_3 has been measured over the Antarctic (60°–90° S) by the space borne instrument SCIAMACHY (SCanning Imaging Absorption spectroMeter for Atmospheric CHartography) on board the ENVISAT (ENVIromental SATellite), using lunar occultation measurement technique. From the visible spectral band (610–680 nm) containing NO_3 absorption lines at 623 and 662 nm, vertical profiles of NO_3 have been retrieved. To verify the validity and consistency in the retrieved NO_3 vertical profiles, a comparison of the retrieved NO_3 and calculated NO_3 profiles using a 1-D photochemical model is performed. The NO_3 profiles calculated from the full 1-D photochemical stacked box model show good agreement with retrieved NO_3 profiles between 24 to 50 km within the estimated accuracy of 20–35%. A good agreement (high positive correlation) was observed between retrieved NO_3 and 1-D steady state model outputs from 24 to 40 km.