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Validation of satellite total ozone and NO_2 data by ERS-2 GOME, ENVISAT SCIAMACHY and AURA OMI with ground-based UV-Visible measurements over Russia and NIS

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Russia and NIS (New Independent States) have a set of locations with regular ground-based UV-visible measurements of NO_2 vertical columns. Some of the instruments are involved in the NDSC program as a complementary. Besides, a special ground-based ozone-monitoring network enumerates about 20 stations over the Russia and NIS with regular measurements by UV filter ozonometers (14-130E/43-78N). These measurements provide considerable contribution to WOUDC database.

The present study is focused on validation results of the recent GOME, SCIAMACHY and OMI nadir level 2 data by means of comparisons with correlative ground-based measurements over Russia/NIS in 2004-2005, within the respective ERS AO3-174, ENVISAT AO-427 and ESA/NIVR AO-2926 validation projects. According to the results of comparisons for total ozone measurements at 14 locations in Russia, the average difference with operational satellite data is –3.3$\pm$6.2%, –2.0$\pm$9.4% and 0.0$\pm$6.0% for TOMS, GOME and OMI, respectively (another OMI total ozone product, OMI DOAS, differ with our ground-based data by +1.9$\pm$7.6%). In addition, comparison with total NO_2 measurements at Issyk-Kul mountainous UV-visible station in Central Asia (Kyrgyzstan) revealed an agreement of satellite data with ground-based sunrise observations within $\pm$15% for OMI NO_2 product. The latter is attributed to time difference between ground-based twilight and satellite local noon overpass, considering known NO_2 diurnal variation. Similar measurements carried out at St.Petersburg (Rus-

sia) suffer from frequent tropospheric pollution events, observed both in ground-based and satellite co-located data. However, there is a promising correlation between these datasets and in situ surface NO_2 measurements during such episodes.