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Ground-based remote sensing of XCO_2 and XCH_4 in the atmosphere of Ural and comparison with GOSAT L2 retrievals

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Ground-based remote sensing of atmospheric CO_2 and CH_4 is actively developed during the last decades. Such networks as TCCON and NDACC perform continuous monitoring of the atmospheric composition with numerous stations covering the globe. These data allow to track changes of atmospheric compounds and to validate remote satellite measurements like IASI and GOSAT observations.

However, the huge territory of Russia remains a “white spot” for the ground-based remote sensing community. Located at the border between Europe and Asia (57.036°N, 59.546E, 270m above the sea level), the Ural Atmospheric Station provides routine measurements of atmospheric transmittance spectra in the near infrared region using Bruker IFS-125M spectrometer. Though the station is not the part of TCCON or NDACC networks, the instrument is aligned and operates according TCCON requirements. It was shown before that measurements taken at the station are representative for the wide area of Western Siberia region.

This study presents time series of XCO_2 and XCH_4 retrieved using TCCON GGG software package from measurements recorded during 2012–2014 years. A brief comparison with GOSAT L2 retrievals, which are publicly available, is also represented. The stability of the instrument is discussed.