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Validation of ACE-FTS v2.2 methane profiles from the upper troposphere to the lower mesosphere

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Abstract. The ACE-FTS (Atmospheric Chemistry Experiment – Fourier Transform Spectrometer) solar occultation instrument that was launched onboard the Canadian SCISAT-1 satellite in August 2003 is measuring vertical profiles from the upper troposphere to the lower mesosphere for a large number of atmospheric constituents. Methane is one of the key species. The version v2.2 data of the ACE-FTS CH_4 data have been compared to correlative satellite, balloon-borne and ground-based Fourier transform infrared remote sensing data to assess their quality. The comparison results indicate that the accuracy of the data is within 10% in the upper troposphere – lower stratosphere, and within 25% in the middle and higher stratosphere up to the lower mesosphere (<60 km). The observed differences are generally consistent with reported systematic uncertainties. ACE-FTS is also shown to reproduce the variability of methane in the stratosphere and lower mesosphere.

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