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Technical note: First spectral measurement of the Earth's upwelling emission using an uncooled wideband Fourier transform spectrometer

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Abstract. The first spectral measurement of Earth's emitted radiation to space in the wideband range from 100 to 1400 cm⁻¹ with 0.5 cm⁻¹ spectral resolution is presented. The measurement was performed from a stratospheric balloon in tropical region using a Fourier transform spectrometer, during a field campaign held in Brazil in June 2005. The instrument, which has uncooled components including the detector module, is a prototype developed as part of the study for the REFIR (Radiation Explorer in the Far InfraRed) space mission. This paper shows the results of the field campaign with particular attention to the measurement capabilities of the prototype. The results are compared with measurements taken by IASI-balloon (Infrared Atmospheric Sounding Interferometer – Balloon version), aboard the same platform, and with forward model estimations. The infrared signature of clouds is observed in the measurements.

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