Highly sensitive Fourier-transform absorption spectroscopy with LED sources

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It is shown that the use of high luminance LED emitters as a light source for Fourier transform spectrometers permits to enhance their threshold sensitivity in the visible range by orders of magnitude. Using a 2.5 W Edixeon EDEI-1LS3 emitter in the range of 11350 - 11700 cm^{-1} as a light source for the spectrometer with a 60-cm multipass cell during a 24-hour measurement time, we have achieved a signal-to-noise ratio of $4.5x10^4$ which corresponds to the minimal detectable absorption coefficient of $1.2x10^{-8}$ cm^{-1}.
Such enhanced sensitivity spectrometer has been used to measure the transition frequencies of CO_2 vibrational bands 00051-00001 and 01151-01101 in the range of 11400−11500 cm^{-1}.

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