High resolution broadband terahertz spectroscopy using a frequency multiplier chain

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The frequency multiplication technique based on Schottky diodes has been successfully implemented in Lille over the last five years. Our absorption spectrometers coupled to a sensitive frequency modulation detection technique were used to characterize the rotational spectra of various species, in the 75-990 GHz range, with high resolution and high accuracy.

A new frequency multiplication chain from Virginia Diodes, Inc. has been recently implemented. A frequency range going from 1.09 to 1.52 THz can be continuously scanned with an output power of about 20 μW.

The main characteristics of our new THz spectrometer will be presented, and its performances will be illustrated with a spectroscopic study of formaldehyde.

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