THZ HETERODYNE SPECTROSCOPY ON THE AILES BEAMLINE OF SOLEIL FACILITY USING THE SYNCHROTRON RADIATION EMITTED BY THE MULTIBUNCH OPERATION MODE

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The goal of our project is to develop a new high-resolution spectrometer on the AILES beamline of synchrotron SOLEIL. The spectrometer will record absorption spectra in the 1–5 THz range with sub-MHz resolution using a heterodyne detection scheme. We recently performed a test experiment using the far-IR continuum produced by synchrotron radiation in the multibunch mode, a multiplication chain as local oscillator, and a hot electron bolometer (HEB) as heterodyne mixer. The set-up allowed the detection of one D_2O absorption line centered at about 782 GHz ($^RQ(4)_{0,4}$) with a resolution better than 1 MHz. We will present the details of the experiment and some instrumental developments in progress.

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