

## A new FIR microscope at IRIS

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Far-infrared spectroscopy with diamond-anvil-cells provides important insights in pressure-induced structural changes in minerals [1-3]. By taking advantage of the high brilliance and the extremely small spatial resolution of the synchrotron beam, one can perform FIR measurements down to the diffraction limit, i.e. investigate microscopic samples. For this purpose, we have successfully designed, constructed, and commissioned a long-working range horizontal THz/FIR microscope at the IRIS beamline of BESSY II synchrotron facility. This newly-developed setup is an improvement over the old design [1-3], as it uses extra-large Cassegrain objectives, thus keeping the high numerical aperture while providing a long working range. The parts are placed within housing in order to purge the beam path with nitrogen.

We will present our first experiments performed with this newly-commissioned FIR setup, which consist primarily of pressure-dependent far-infrared measurements on selected carbonate samples.

[1] M. Mrosko, M. Koch-Müller, and U. Schade, *Amer. Miner.* 96, 1748-1759 (2011).

[2] M. Koch-Müller, M. Mrosko, M. Gottschalk, and U. Schade, *Europ. J. Mineral.*, 24, 831- 838 (2012).

[3] M. Koch-Müller, S. Jahn, N. Birkholz, E. Ritter, and U. Schade, *Phys. Chem. Miner.* 43, 545 – 561 (2016).