Angular filtering for Brillouin spectroscopy in the 20-300 GHz frequency range

A. Rodriguez, Priya, O. Ortiz, P. Senellart, C. Gomez-Carbonell, A. Lemaître, M. Esmann, N.D. Lanzillotti-Kimura

Centre de Nanosciences et de Nanotechnologies, 10 Boulevard Thomas Gobert, 91120 Palaiseau, France
anne.rodriguez@c2n.upsaclay.fr

**Motivation**

To observe GHz acoustic modes of a tunable optophononic cavity which are not accessible with standard Raman or Brillouin scattering.

- Inelastic scattering of light induced by vibrations of a crystal

**Results**

- Sequential **point-by-point reconstruction** of Brillouin spectra
- **Resolution** of 2 GHz
- **Enhancement of Signal to Background Ratio** by a factor: x4 at 18.3 GHz, x7 at 40 GHz

**Conclusions**

- **Spatial filtering** obtained by combining the fiber and the Double Optical Resonance
- **Spectral filtering** obtained with the etalon and the intermediate slit

**References**

- Esmann et al, Optica 6(7), 854 (2019)
- Fainstein et al, PRL 75 3764 (1995)
- Rodriguez et al, Optics Express 29(2), 2637 (2021)