Soutenance de thèse

Lundi 20 mars
14h00 – Amphithéâtre

Brillouin scattering in optophononic heterostructures working at ultrahigh acoustic frequencies

Anne RODRIGUEZ

Jury members :

Daniel Lanzilloti Kimura (Directeur de thèse) – C2N - CNRS, Université Paris-Saclay
Olivier BOURGEOIS (rapporteur et examinateur) – Institut Néel – Université Grenoble-Alpes, CNRS
Jérémie MARGUERITAT (rapporteur et examinateur) – Institut Lumière matière – Université de Lyon
Delphine MARRIS-MORINI (examinatrice) – C2N - CNRS, Université Paris-Saclay
Clivia SOTOMAYOR-TORRES (examinatrice) – ICN2 - Universitat Autonoma de Barcelona
Chris STURM (examinateur) – Felix-Bloch-Institut für Festkörperphysik - Universität Leipzig

Abstract :

Nanophononics, i.e. acoustic phonon engineering, is a promising research domain with potential in the manipulation of sound and heat at the nanometric scales. Research on the vibrational properties of systems formed by semiconductor multilayers has permitted to achieve a new level of understanding of acoustic phonons in these structures.
In this work, we introduce topological phononic devices made of semiconductor superlattices to control the propagation and confinement of acoustic phonons in the tens to hundreds of gigahertz range.
We developed Brillouin spectroscopy experimental schemes to access the confined acoustic modes in planar and micropillar optophononic cavities where both light in the near infrared range and acoustic phonons in the 20 GHz range can be simultaneously confined.

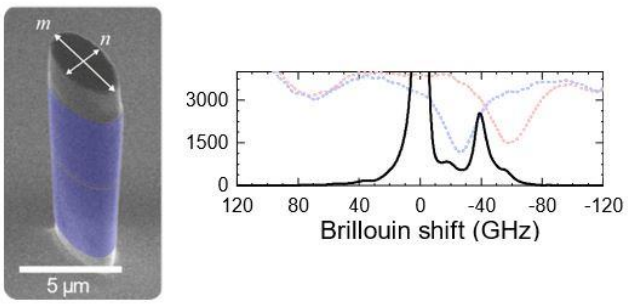

Figure SEM image of an optophononic micropillar cavity with an elliptical cross-section. Brillouin spectrum acquired on a micropillar.