25e Congrès Général de la Société Française de Physique

ID de Contribution: **183** Type: **Poster**

Experimental study of Dirac cones merging in photonic Honeycomb lattices

So far, the development of micro-fabrication techniques in semiconductor materials has led to the engineering of high quality lattices of polariton microcavities. The main advantage of this system is that both the wave functions and the spectrum associated to the lattice hamiltonian can be directly measured in photoluminesce experiments[1] In this work, taking advantage of the fine control in the engineering of polariton lattices, we experimentally investigate the topological transition that takes place when graphene is uniformly strained[2]. We consider honeycomb lattices of polariton microcavities in which the hopping parameters change on the vertical direction only. This hopping control emulates the unidirectional strain in a real graphene and, consequently, modifies the band structure of the lattice leading to a topological transition. By scanning the frequencies of the luminescence light emitted by the honeycomb polariton lattices, we observe the different dispersion and diffusion features that this topological transition exhibits; such as the semi-Dirac dispersion and the vanishing of the so-called bearded edge state. The engineering of more elaborate strain patterns, or the application of strain to orbital bands appear as a very promising way to explore novel kinds of Dirac cones and band crossings[3].

[1] M. Milicevic et al. Phys. Rev. Lett. 118, 107403 (2017)

[2] G. Montamboux et al. Phys. Rev. B 80, 153412 (2009)

[3] M. Milicevic et al. arXiv: 1807.08650.

Choix de session parallèle

2.3 Fluides quantiques et lumière

Auteurs principaux: REAL, Bastián (Université de Lille - CNRS); Dr JAMADI, Omar (Université de Lille - CNRS); MILECEVIC, Marijana (Centre de Nanosciences et de Nanotechnologies, CNRS, Univ. Paris-Sud, Universite Paris-Saclay, C2N - Marcoussis); Dr MONTAMBOUX, Giles (Laboratoire de Physique des Solides, CNRS, Univ. Paris-Sud, Universite Paris-Saclay); Dr OZAWA, Tomoki (Interdisciplinary Theoretical and Mathematical Sciences Program (iTHEMS)); SAGNES, Isabelle (Centre de Nanosciences et de Nanotechnologies, CNRS, Univ. Paris-Sud, Universite Paris-Saclay, C2N - Marcoussis); Dr LAMAÎTRE, A (Centre de Nanosciences et de Nanotechnologies, CNRS, Univ. Paris-Sud, Universite Paris-Saclay, C2N - Marcoussis); Dr LE GRATIET , Loic (Centre de Nanosciences et de Nanotechnologies, CNRS, Univ. Paris-Sud, Universite Paris-Saclay, C2N - Marcoussis); Dr HAROURI, A (Centre de Nanosciences et de Nanotechnologies, CNRS, Univ. Paris-Sud, Universite Paris-Saclay, C2N - Marcoussis); Dr BLOCH, Jacqueline (Centre de Nanosciences et de Nanotechnologies, CNRS, Univ. Paris-Sud, Universite Paris-Saclay, C2N - Marcoussis); Dr AMO, Alberto (Université de Lille - CNRS)

Orateur: REAL, Bastián (Université de Lille - CNRS)

Classification de Session: Séance Poster