25e Congrès Général de la Société Française de Physique

ID de Contribution: **241** Type: **Orale**

Topological properties of Bismuth nanowires revealed with superconducting proximity effect

mercredi 10 juillet 2019 09:30 (30 minutes)

Bismuth is a semimetal with a long history in condensed matter that continues to surprise us today. We demonstrated experimentally that single crystal Bismuth nanowires carry current predominantly along its edges in a ballistic way, using superconducting proximity effect.
A recent theoretical work confirmed our findings, by showing that Bismuth belongs to the newly discovered second order topological class, which means that it carries one dimensional states living on the hinges of some facets of the three dimensional crystal. These hinge modes have the exceptional property of having their their momentum locked to their spin, thereby impeding retro-diffusion in absence of time reversal symmetry breaking.
Besides ballistic transport, this also implies that the spectrum of the states carrying the super-current has the peculiarity to have no anticrossing. We could perform a microwave absorption measurement that demonstrates this property on a well characterized system, up to a frequency resolution of 0.4 GHz.

Choix de session parallèle

3.3 Propriétés remarquables des matériaux topologiques : de la théorie à la réalisation expérimentale

Auteur principal: MURANI, Anil (Laboratoire de Physique des Solides, Orsay ; Quantronics Group, Service de Physique de l'État Condensé, CEA-Saclay)

Orateur: MURANI, Anil (Laboratoire de Physique des Solides, Orsay ; Quantronics Group, Service de Physique de l'État Condensé, CEA-Saclay)

Classification de Session: Séance Parallèle