

| | |
|--|---|
| Progetto | Time Domain THz Spectroscopy to Measure the Properties of Axion Quasiparticles |
| Esperimento / sigla proponente | QUAX |
| Laboratorio ospitante | LNL |
| Contact person presso il laboratorio | Antonello Ortolan |
| Periodo previsto: | Luglio 2021 – Dicembre 2021 |
| Sezioni e tutor proponenti: | PD-Caterina Braggio; LNL-Antonello Ortolan |
| Descrizione attività (max 1000 caratteri) | <p>Axions are very light, very weakly interacting particles, whose existence was posited more than 40 years ago in order to clean up our ‘standard model’ of particle physics” are the words Nobel prize F. Wilczek uses to describe this invisible particle, whose existence could also explain the missing dark matter of the Universe. Despite intensive searches, axions have yet to be observed, and the experimental landscape is rapidly evolving, with many novel detection concepts and new experimental proposals.</p> <p>In this thesis the recent proposal to search for a dynamic axion field in antiferromagnetic topological insulators (AF-TIs) [1] is experimentally addressed. AF-TIs are a recently discovered class of materials that combine non-trivial band topology and magnetic order.</p> <p>As the equations that arise in axion physics are the same as those that describe the electromagnetic behaviour of AF-TIs, measurement of their transmission and reflection coefficients in the presence of an applied magnetic field can be used to infer the existence of axion-polaritons composed of the axion quasiparticle and the electric field.</p> <p>The time domain THz spectroscopy apparatus recently developed at the INFN Legnaro laboratories will be used during the thesis work to search for a resonance whose frequency and width coincide with the relevant polariton parameters necessary to use AF-TIs as axion dark matter detectors. The measurement will be performed at a series of cryogenic temperatures and large magnetic fields.</p> |
| Altre indicazioni: (max 500 caratteri) | |
| Facility che il laboratorio ospitante mette a disposizione | Foresteria se possibile accesso; mensa |
| Note: | |

codice fiscale 84001850589