

Contribution ID: 20

Type: Oral Contribution

CALDER: high sensitivity cryogenic light detector.

Thursday, 23 June 2016 11:40 (25 minutes)

The current bolometric experiments searching for rare events as neutrino-less double beta decay or dark matter interaction demand for cryogenic light detectors with high sensitivity, large active area and excellent scalability and radio-purity in order to reduce their background budget. The CALDER project aims to develop such kind of light detectors implementing phonon-mediated Kinetic Inductance Detectors (KIDs). The goal for this project is the realization of a $5 \times 5\text{-cm}^2$ light detector working between 10 and 100-mK with a baseline resolution RMS below 20-eV.

KIDs have already demonstrated their potentiality as direct detectors of photons for different astrophysical applications. The aim of our project is to apply this technology in Particle Physics, using indirect detection. These devices can be operated in a phonon-mediated approach, in which KIDs are coupled to a large insulating substrates in order to increase the active surface from a few mm^2 to 25-cm^2 .

We have already demonstrated the feasibility of a phonon-mediated KIDs-based light detectors, using aluminum sensors. These device reached a baseline sensitivity of 80-eV with an overall efficiency of about 10%. Currently we are testing new materials (e.g. Ti-Al and non stoichiometric TiN) to enhance the sensitivity and reach the goal of our project. We will present our results and the physical interpretation of the device behaviour.

Primary author: CASALI, Nicola (ROMA1)

Co-authors: COPPOLECCHIA, Alessandro (ROMA1); CRUCIANI, Angelo (ROMA1); D'ADDABBO, Antonio (LNGS); COSMELLI, Carlo (ROMA1); TOMEI, Claudia (ROMA1); BELLINI, Fabio (ROMA1); COLANTONI, Ivan; CARDANI, Laura (ROMA1); Dr VIGNATI, Marco (ROMA1); CASTELLANO, Maria Gabriella; MARTINEZ PEREZ, Maria Lucia (ROMA1); DI DOMIZIO, Sergio (GE)

Presenter: CASALI, Nicola (ROMA1)

Session Classification: Session 4: MKIDs for other applications - Part 1

Track Classification: MKIDs for other applications