



Contribution ID: 297

Type: Poster

## Kinetic Inductance Detectors as light detectors for neutrino and dark matter searches

Large-mass arrays of bolometers proved to be good detectors for Neutrinoless Beta Decay (0 $\nu$ DBD) and Dark Matter (DM) searches. The CUORE and LUCIFER 0 $\nu$ DBD experiments at Laboratori Nazionali del Gran Sasso will start to take data in 2015. The potential of CUORE could be increased by removing the background due to alpha particles, by detecting the small amount of Cherenkov light (100 eV) emitted by the beta signal and not by alphas. LUCIFER could be extended to detect also Dark Matter, provided that the background from beta/gamma particles (100 eV of scintillation light) is discriminated from nuclear recoils of 10 keV energy (no light).

Our aim is to develop light detectors for CUORE, LUCIFER and similar bolometric experiments. In order to reach the high sensitivity and large number of pixels needed, we plan to use Microwave Kinetic Inductance Detectors, which have already shown impressive results in millimeter astronomy.

Since these devices are easily multiplexable and not strongly limited by the operation temperature, they possibly represent the best choice for the realisation of large-area phonon-mediated light detectors. Our aim is to monitor the whole face of each bolometer (about 25 cm<sup>2</sup>) at an operating temperature of 10 mK.

We will show a model of the expected sensitivity and discuss its agreement with the optical results of two different generations of devices, that have been illuminated with a <sup>55</sup>Fe source and a light pulser.

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**Track Classification:** Experiments: 2c) Detectors for neutrino physics