



Contribution ID: 164

Type: Oral presentation (young scientists)

A low-threshold diamond cryogenic detector for sub-GeV Dark Matter searches

Monday 18 July 2022 17:40 (10 minutes)

In recent years numerous experiments have started to probe the sub-GeV dark matter (DM) mass region. In order to detect such light DM particle masses, detectors with a low energy threshold are required.

Recent developments in the growth processes of diamond crystals allow for the production of high-quality large-mass diamond detectors that can be used for astroparticle physics research purposes.

Thanks to their superior properties, diamond detectors can reach an energy threshold in the eV range when operated as cryogenic calorimeters.

In this contribution the realization of the first low-threshold cryogenic detector that uses diamond as absorber for astroparticle physics applications will be reported. Two 0.175 g CVD diamond samples, each instrumented with a W-TES have been tested. The sensors showed transitions at about 25 mK. The performance of the diamond detectors will be presented highlighting the best performing one, where an energy threshold as low as 16.8 eV could be obtained.

Authors: GARAI, Abhijit (Max Planck Society (DE)); ABDELHAMEED, Ahmed (Max-Planck-Institut für Physik); CANONICA, Lucia (Max Planck Institut for Physics); BERTOLINI, Anna (Max Planck Society (DE)); BENTO, Antonio (Max-Planck-Institut für Physik and LIBPhys-UC, Departamento de Fisica, Universidade de Coimbra); NILIMA, Athoy (Max Planck Institute for Physics); HAUFF, Dieter; FUCHS, Dominik (Max Planck Institute for Physics); BERTOLDO, Elia; PETRICCA, Federica (Max Planck Society (DE)); PUCCI, Francesca (Max Planck Society (DE)); PROBST, Franz (Max Planck Society (DE)); ANGLOHER, G. (Max-Planck-Institut für Physik); ROTHE, Johannes; MANCUSO, Michele (Max-Planck-Institut für Physik); FERREIRO, Nahuel

Presenter: BERTOLINI, Anna (Max Planck Society (DE))

Session Classification: Parallel 1A - Direct detection I