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Direct dark matter search with the CRESST-III experiment

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The CRESST (Cryogenic Rare Event Search with Superconducting Thermometers) experiment aims at the direct detection of dark matter particles via their elastic scattering off nuclei. The target material consists of scintillating CaWO_4 single crystals operated as cryogenic detectors at a temperature of $\sim 10\text{mK}$. For several years, these crystals have successfully been produced within the collaboration at the Technical University of Munich (TUM) and a significant improvement in radiopurity could be achieved. In CRESST-II Phase 2, an extended physics run between 2013 and 2015, the experiment demonstrated its leading sensitivity in the field of direct searches for dark matter masses below $\sim 1.7\text{GeV}/c^2$. A further detector optimization for the search of low-mass dark matter particles was performed for CRESST-III, whose Phase 1 started taking data in summer 2016. In this contribution the performance of the CRESST-III detectors as well as preliminary results will be presented. Requirements and perspectives for the upcoming CRESST-III Phase 2, in particular with respect to radiopurity, will be discussed.

Author: MÜNSTER, Andrea (Technical University of Munich (TUM))

Presenter: MÜNSTER, Andrea (Technical University of Munich (TUM))

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