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Improving background levels of $CaWO_4$ detectors for the CRESST dark matter search

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The CRESST (Cryogenic Rare Event Search with Superconducting Thermometers) experiment, its third phase has successfully started in summer 2016, aims at the direct detection of dark matter particles. CRESST uses $CaWO_4$ crystals operated as cryogenic detectors at a temperature of ~10mK. During recent years, the intrinsic radiopurity of $CaWO_4$ crystals, the capability to reject recoil events from alpha-surface contamination and the energy threshold were improved significantly. In the talk I will discuss the various techniques to reduce external and crystal-intrinsic background levels, including purification methods of raw materials for CaWO4 crystal growth. I will conclude that these improvements strongly increase the sensitivity of CRESST detectors, in particular, for light-mass dark matter particles.

Primary author: Dr STRAUSS, Raimund (Max-Planck-Institut für Physik München)

Presenter: Dr STRAUSS, Raimund (Max-Planck-Institut für Physik München)

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