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The CRESST experiment: Current status and future development

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Located in the Gran Sasso underground laboratory, the CRESST experiment aims for the direct detection of dark matter by using cryogenic calorimeters to detect dark matter induced nuclear scattering processes in scintillating CaWO4 crystals. The identification and rejection of backgrounds is crucial for rare event searches like CRESST. Therefore, a two channel readout detector is implemented that allows to distinguish between different particle interactions by the ratio of energy deposited directly in the CaWO4, measured as heat, and the amount of scintillation light being simultaneously produced. In the last physics run, CRESST-II (Phase 2) was able to explore new regions in the DM parameter space and to set the leading limit for dark matter masses below ≈1.7 GeV/c2 . In the future (CRESST-III (Phase 1)), the CRESST experiment will focus on the low-mass dark matter region. Based on established detector techniques, a new detector module was developed which is optimized for very low detection thresholds (<100 eV). Featuring a 10 times smaller CaWO4 crystal, the heat channel of the detectors is significantly improved compared to older designs and opens access to new regions in the dark matter parameter space. Currently, this new generation of detectors is installed underground and ready for data

taking. The talk will give an overview of the latest results and of the current status of the detector R&D.

Primary author: Mr WUESTRICH, Marc (Max-Planck-Institute f. Physics) Presenter: Mr WUESTRICH, Marc (Max-Planck-Institute f. Physics)