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Direct search for light dark matter with the CRESST-III experiment

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In absence of an unambiguous dark matter signal direct searches need to cover a wide range of potential dark matter particle masses. Thanks to their low energy thresholds, cryogenic experiments push the low-mass frontier with CRESST opening up the sub-GeV/ c^2 regime.

CRESST-III employs scintillating CaWO₄ crystals as target material operated at mK temperatures. The phonon signal allows for a very precise measurement of the deposited energy while the simultaneously acquired scintillation light provides particle discrimination on an event-by-event basis. In early 2018 CRESST-III completed an initial data taking campaign reaching nuclear recoil thresholds of well below 100eV. This unprecedented low threshold provides a significant boost in sensitivity beyond CRESST-II which achieved a threshold of 0.3keV allowing for the first time to probe dark matter masses as low as 500MeV/ c^2 . New results of CRESST-III will be presented accompanied by a brief status update on the ongoing CRESST-III measurement campaign started in May 2018.

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