Poster session 4 – Friday 8 July

P4.008 **Direct dark matter search with the CRESST-III experiment - status and perspectives**

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The CRESST-III (Cryogenic Rare Event Search with Superconducting Thermometers) experiment located in the Gran Sasso underground laboratory (LNGS, Italy) aims at the direct detection of dark matter (DM) particles. Scintillating $CaWO_4$ crystals operated as cryogenic detectors are used as target material for DM-nucleus scattering. The simultaneous measurement of the phonon signal from the $CaWO_4$ crystal and the emitted scintillation light in a separate cryogenic light detector is used to discriminate backgrounds from a possible dark matter signal.

As already demonstrated by the CRESST-II experiment, a high sensitivity for low mass (< 10 GeV/c^2) dark matter particles can be achieved with cryogenic particle detectors. With the CRESST-III experiment, we plan to significantly improve this sensitivity by using dedicated detector modules optimised for a low nuclear recoil energy threshold of $\sim$ 100 eV. Each detector module consists of a $\sim$ 24 g $CaWO_4$ target crystal and a 20x20 mm^2 Silicon-on-Sapphire light detector. In order to reject events from surface-alpha decays, the inner detector housing is fully scintillating. To achieve a low intrinsic radioactive background of the target crystals, mainly CaWO4 crystals grown in-house at the Technische Universität München will be used. In phase 1 of the CRESST-III experiment, 10 detector modules with a total target mass of 250g will be operated for 1 year, resulting in an exposure before cuts of 50 kg days.

The experiment is expected to start data-taking in spring of 2016. We present the current status of the experiment and the projections of the sensitivity on spin independent DM-nucleon scattering. Furthermore, we describe perspectives of a planned future upgrade of the experiment which will consist of up to 100 detector modules with a total $CaWO_4$ target mass of $\sim$ 2.5 kg.