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Sub-GeV Dark Matter Searches with EDELWEISS and CRYOSEL

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The EDELWEISS collaboration searches for light Dark Matter (DM) particles using germanium detectors equipped with a charge and phonon signal readout.
To circumvent the problem of the large background of events with no ionisation signal ("Heat-Only" events) that limit the sensitivity of our detectors equipped with Ge-NTD sensors, the collaboration has tested the use of NbSi Transition Edge Sensors (TES). The observed HO background reduction in a 200g detector equipped with a TES readout and operated underground in the Laboratoire Souterrain de Modane (LSM) has yielded a sensivity to DM masses down to 32 MeV/c² and cross sections down to 10-29 cm². Further improvements have been more recently obtained by exploting the phonon yield from the Neganov-Luke-Trofimov effect to better resolve electron recoils from HO events. These results pave the way for a new detector design, named CRYOSEL, that is being optimized for such a discrimination.

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