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First EDELWEISS-II results

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The EDELWEISS-II collaboration has performed a direct search for WIMP dark matter with an array of ten 400 g heat-and-ionization cryogenic detectors equipped with interleaved electrodes for the rejection of near-surface events. Six months of continuous operation at the Laboratoire Souterrain de Modane have been achieved. The observation of one nuclear recoil candidate above 20 keV in an effective exposure of 144 kgd is interpreted in terms of limits on the cross-section of spin-independent interactions of WIMPs and nucleons. A cross-section of 1.0×10^{-7} pb is excluded at 90%CL for a WIMP mass of 80 GeV/c². This result demonstrates for the first time the very high background rejection capabilities of these simple and robust detectors in an actual WIMP search experiment. The future prospects for this experiment are also discussed.

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