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## Search for neutrinoless double beta decay of $^{128}\text{Te}$ with the CUORE experiment

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The CUORE experiment is a ton-scale array of  $\text{TeO}_2$  cryogenic bolometers located at the underground Gran Sasso National Laboratories, in Italy. The CUORE detector consists of 988 crystals operated as source and detector at a base temperature of  $\sim 10$  mK. The primary goal of CUORE is the search for neutrinoless double beta ( $0\nu\beta\beta$ ) decay of  $^{130}\text{Te}$ , but thanks to its large target mass and ultra-low background it is suitable for the study of other rare processes as well, one of these being the  $0\nu\beta\beta$  decay of another tellurium isotope: the  $^{128}\text{Te}$ . The  $^{128}\text{Te}$  is an attractive candidate for the search of this process, due to its high natural isotopic abundance of 31.75%. The transition energy at  $Q_{\beta\beta} = (866.6 \pm 0.9)$  keV lies in a highly populated region of the energy spectrum, dominated by the contribution of the  $2\nu\beta\beta$  decay of  $^{130}\text{Te}$  and the natural  $\gamma$  background due to environmental radioactivity. With its ton-scale mass, CUORE is able to achieve a factor  $>10$  higher sensitivity to the  $0\nu\beta\beta$  decay of this isotope with respect to past direct experiments.

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