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First results from the CUORE $0\nu\beta\beta$ decay experiment[1] ALEXEY DROBIZHEV, University of California, Berkeley; Lawrence Berkeley National Laboratory, CUORE COLLABORATION — CUORE—the Cryogenic Underground Observatory for Rare Events—is an experiment searching for the $0\nu\beta\beta$ decay of ^{130}Te, located at the Laboratori Nazionali del Gran Sasso in Italy. The detector comprises 988 $5 \times 5 \times 5$ cm^3 TeO_2 crystals operated as bolometers at $\sim$10 mK in the world's largest and most powerful dilution refrigerator. CUORE began physics data collection in spring 2017, and has recently published a lower limit of $T^{0\nu}_{1/2}(^{130}Te) > 1.3 \times 10^{25}$ y (90% C.L.) on the decay half-life—the most sensitive to date for this isotope. We present the analysis leading to this result, including a discussion of spectral line shape modeling and fitting.

[1]The DOE Office of Science, Office of Nuclear Physics

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