

Abstract Submitted
for the DNP08 Meeting of
The American Physical Society

CUORE: The Three Towers Test¹ ALISON GOODSSELL, LAURA SPARKS, California Polytechnic State University San Luis Obispo, CUORE COLLABORATION² — CUORE (Cryogenic Underground Observatory for Rare Events) will be part of the next generation of detectors used to search for neutrinoless double beta decay ($0\nu\beta\beta$). Located in Assergi, Italy at the Gran Sasso National Laboratory (LNGS), CUORE will be a large cryogenic bolometer composed of 988 tellurium dioxide (TeO_2) detectors with a total mass of 750 kg, and will search for $0\nu\beta\beta$ in ^{130}Te . The intermediate upgrade, CUORE-0, first involves the disassembly of Cuoricino, CUORE's smaller counterpart in operation since 2003, and the readying of the Three Towers test, a diagnostic detector configuration. As the experiment will monitor the extremely rare event of $0\nu\beta\beta$, all factors contributing to background need to be minimized to effectively increase the sensitivity. We assisted the LNGS researchers over the summer of 2008 by supporting R&D work with the Three Towers test to reduce the radioactive background of the experiment. Activities involved decontaminating the copper frame of radon daughters, and chemically etching and lapping the TeO_2 crystals with nitric acid and silicon dioxide, respectively, to remove surface contaminants which contribute to background counts. This work was supported in part by NSF grant PHY- 0653284 and the California State Faculty Support Grant.

¹NSF and California State Faculty Support Grant

²We are not official members of the CUORE collaboration.

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Date submitted: 14 Aug 2008

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