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Search for fractional charged particles with the MAJORANA DEMONSTRATOR[1] RALPH MASSARCZYK, Los Alamos National Laboratory, MAJORANA COLLABORATION — Neutrinoless double-beta decay searches play a major role in determining neutrino properties. Located at the Sanford Underground Research Facility in Lead, South Dakota, the MAJORANA collaboration is operating an ultra-low background detector array to search for this decay in ^{76}Ge. A mile underground, heavily shielded, and with its low energy thresholds and excellent energy resolution, the array of germanium detectors also allows searches of new physics beyond the standard model. Here, we present one such search for free particles with electrical charges less than the elementary charge, which are predicted by some extensions of the standard model. Such particles have not been observed and direct searches can restrict model parameter space. Using the results from our first year of physics data with the DEMONSTRATOR, new direct-detection limits on the flux of lightly ionizing particles with charges as low as $e/1000$ can be set. The talk will give an overview on the experimental analysis and discuss the results. This material is based upon work supported by the U.S. DoE, Office of Science, Office of Nuclear Physics, the Particle Astrophysics and Nuclear Physics Programs of the National Science Foundation, and Sanford Underground Research Facility.

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Ralph Massarczyk
Los Alamos National Laboratory

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