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The EXO-200 double beta decay experiment

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The Enriched Xenon Observatory (EXO) experimental program is searching for the neutrino-less double beta decay of xenon-136. A first stage experiment called EXO-200 is running at the WIPP salt mine in New Mexico, and has made the first measurement of the standard electroweak 2-neutrino double beta decay of Xe-136. EXO-200 uses 200 kg of xenon enriched to 80% in the 136 isotope, a large fraction of which is liquefied and constitutes the source and active medium to detect ionizing interactions in its bulk. The detector is instrumented as a double time projection chamber (TPC) in which both the ionization and the scintillation signals are detected to maximize energy resolution. The entire detector is designed to achieve the lowest possible radioactive background in its xenon core, and implements numerous innovative detector technologies. Noteworthy are the use of ~500 silicon avalanche photodiodes to detect the 175 nm xenon scintillation, the thin copper shell used to contain the xenon and the electrical connections, spring-loaded with no use of solder joints or connectors. The talk will highlight these pioneering features of the EXO-200 detector and report on the latest physics results from the experiment.

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