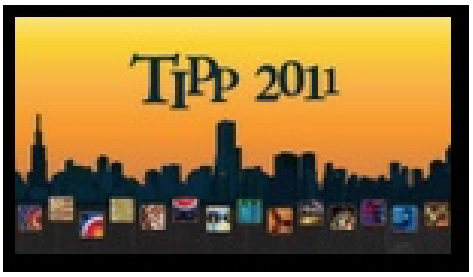

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The Enriched Xenon Observatory (EXO)

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The Enriched Xenon Observatory (EXO) is an experimental program designed to search for the neutrinoless double beta decay (0nbb) of Xe-136. Observation of 0nbb would determine an absolute mass scale for neutrinos, prove that neutrinos are massive Majorana particles (indistinguishable from their own antiparticles), and constitute physics beyond the Standard Model. The current phase of the experiment, EXO-200, uses 200 kg of liquid xenon with 80% enrichment in Xe-136, and also serves as a prototype for a future 1-10 ton scale EXO experiment. The double beta decay of xenon is detected in an ultra-low background time projection chamber (TPC) by collecting both the scintillation light and the ionization charge. The detector is now operational at the Waste Isolation Pilot Plant (WIPP) in New Mexico. It was first run with natural xenon to fully commission it and study its performance. Preparation for physics data taking is underway. The projected two-year sensitivity for neutrinoless double beta decay half-life is 6.4E25 y at 90% confidence level. In view of a future ton scale experiment, the collaboration is performing R&D to realize an ideal, background-free search for which the daughter nucleus produced by the double beta decay is also individually detected. In this talk, the current status and preliminary results from EXO-200 will be presented, and prospects for a ton scale EXO experiment will be discussed.

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