Rencontres de Moriond EW 2013



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Results of EXO

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EXO-200 is a double beta decay experiment, that uses ~200kg of liquid Xe, enriched to ~80% Xe-136, in a cylindrical time projection chamber. EXO-200 is located at the WIPP facility near Carlsbad, New Mexico. Double beta decay is a second order

weak process in the Standard Model (A,Z)X - > (A,Z+2)Y + 2e + 2nu

(2 neutrino double beta decay) and has been measured with 11 even-even isotopes. The first measurement in Xe-136 was made by EXO-200 in 2011, with a half-life of (2.23\pm0.017 stat.\pm0.22 sys)x10^{21}y, which is the longest lived decay directly observed. If the neutrino has a Majorana mass, then it will be allowed to decay via neutrinoless double beta decay (A,Z)X ->(A,Z+2)Y +2e, which violates B-L symmetry. The rate of 0 neutrino double beta decay is related to the Majorana mass of the neutrino. In this talk I will

discuss EXO-200 result from summer 2012 for the 0 neutrino double beta decay half-life of greater than 1.6 x $10^{25}y$ (90% CL), which, depending on the nuclear matrix model used, gives a Majorana neutrino mass of 140-380meV. I will also talk about future physics with EXO-200 and the planed tonne scale Xe-136 detector nEXO.

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Classification de thématique: Experiment