



Contribution ID: 42

Type: **Oral contribution**

Microbulk Micromegas for the search of DBD of ^{136}Xe in the PandaX-III experiment

Thursday, 15 October 2015 09:10 (20 minutes)

The search for the neutrinoless double beta decay (DBD) is one of the most important quests nowadays in neutrino physics. Among the different techniques used, high pressure xenon (HPXe) gas time projection chambers (TPC) stand out because they allow to image the topology of the DBD event (one straggling track ending in two blobs), and use it to discriminate signal from background events. Recent results with microbulk Micromegas in Xe + trimethylamine (TMA) mixtures show high promise in terms of gain, stability of operation, and energy resolution at high pressures (up to 10 bar). The addition of TMA at levels of ~1% reduces electron diffusion in up to a factor of 10 with respect pure Xe, improving the quality of the topological pattern, and therefore the discrimination capability. Moreover microbulk Micromegas have very low levels of intrinsic radioactivity. All these results show that a Micromegas-read HPXe TPC can be a competitive technique in the search for DBD. The recently proposed PandaX-III experiment, based on these results, aims at building a large TPC of 200 kg of enriched Xe, to be located at Jinpin Underground laboratory. In this talk the main features of the experiment will be presented, with an emphasis on the design and tests of the microbulk readout, as well as the status of the project and first results of the prototyping phase.

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Session Classification: Contributed talks

Track Classification: Applications