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Xe-TMA for high-pressure Time Projection Chambers

Monday 1 July 2013 16:45 (1h 10m)

Xe-TMA is a strong Penning mixture at high pressure presumably due to a Nature fine-tuned resonant energy-transfer of Xenon low-lying metastable states to TMA ionized states. Xe-TMA offers many potential advantages for a high pressure gaseous TPC aimed at ultimate energy resolution and topological information, through:
1) An anticipated reduction of the Fano factor, theoretically allowing for beyond-intrinsic energy resolution in Xenon.
2) Scintillation in longer wavelengths more suited to standard photo-multipliers, by wave-length-shifting the 170nm Xe 2nd continuum.
3) Improved drift and diffusion characteristics, allowing for enhanced event topology.
4) A theoretical possibility for electroluminescence proportional multiplication at reduced fields.
A whole survey of these aspects requires various technical approaches and complementary experiments. In the framework of the R&D of the neutrinoless double beta decay experiment NEXT, we will present a first step towards a systematic characterization of this mixture as well as a detailed comparison with simulation.

Presenter: PONS, Pablo

Session Classification: Monday (poster session)