



Contribution ID: 147

Type: **not specified**

Gaseous Time Projection Chamber for Ultra-low Radioactive Material Screening

Friday, 19 March 2021 12:40 (20 minutes)

Ultra-low radioactive material screening is becoming a key requirement for a successful rare event search experiment such as dark matter and neutrinoless double beta decay searches. We proposed a low-background, large-area, and high-granularity gaseous time projection chamber (TPC) with Micromegas readout plane for surface alpha/beta contamination measurements. With the unique tracking capability, the gaseous TPC is able to distinguish the origin of events and identification of particle types. In this presentation, we will describe the conceptual design of the TPC, the screening sensitivity, and the preliminary test of a prototype.

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Session Classification: Gaseous Detectors

Track Classification: Gaseous Detectors