

## Design, Construction and Characterization of a $^3\text{He}$ Proportional Counter for Detecting Thermal Neutron

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**Abstract :** Neutron detectors in general, proportional counters gas filling based isotope  $^3\text{He}$  in particular are going to be essential for monitoring and control of certain nuclear facilities, monitoring of experimentation around neutron beams and channels nuclear research reactors, radiation protection instruments and other tools multifaceted exploration and testing of materials, etc. This work consists of a measurement campaign features two Proportional Counters  $^3\text{He}$  ( $^3\text{He}$ : LND252/USA CP, CP prototype:  $^3\text{He}$  LND/DDM). This is to make a comparison study of a CP  $^3\text{He}$  LND252/USA reference one hand, and in the context of routine periodic monitoring of the characteristics of the detectors for controlling the operation especially for laboratory prototypes. In this paper, we have described the different characteristics of the detectors and the experimental protocols used. Tables of measures have been developed and the different curves were plotted. The experimental campaign at stake: 2 PC  $^3\text{He}$  were thus characterized: Their characteristics (sensitivity, energy pulse height distribution spectra, gas amplification etc.) Were identified: 01 PC  $^3\text{He}$  1" Type: prototype DEDIN/DDM, 01 PC  $^3\text{He}$  1" Type: LND252/USA.

**Keywords :** PC  $^3\text{He}$ , sensitivity, pulse height distribution spectra, gas amplification

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