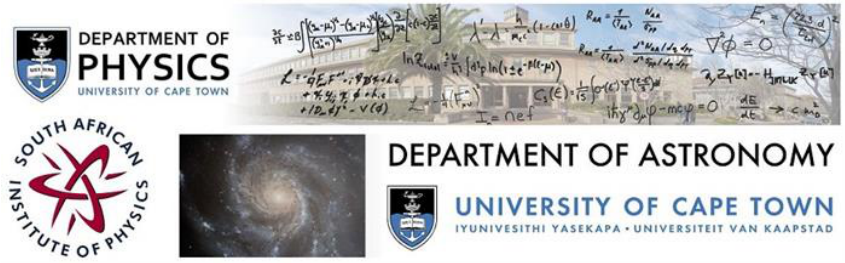

Contribution ID: **428** Type: **Poster Presentation**

A comparison of neutron energy distributions unfolding codes used with a NE213 detector

Wednesday, 6 July 2016 16:10 (1h 50m)

Abstract content
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In fast neutron radiotherapy knowledge of how neutrons transfer energy into body tissue as they progress through the body is required. This knowledge is important to calculate the energy distributions of secondary charged particles, to characterize the radiation quality and absorbed dose both inside and near to the area under treatment. Experimental measurement or Monte Carlo transport codes can be used to determine neutron energy distributions.. Unfolding can be used for processing the measured data and obtaining the neutron energy distribution. The neutron energy distributions have to be unfolded from the measured pulse-height distributions, which is an ill-conditioned problem. Therefore, use of independent unfolding methods allows for comparison and interpretation of the data.

This paper reports on the overall procedure of measuring and unfolding the fast neutron energy distributions with NE213 liquid scintillation detector using the unfolding codes Gravel based on the GRAVEL iterative method and MAXED based on the Maximum Entropy method. The results obtained from pulse height distributions using the different unfolding codes will be presented and discussed.

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Session Classification: Poster Session (2)

Track Classification: Track F - Applied Physics