



Contribution ID: 57

Type: **Talk**

Optimised neutron yield calculations from (α ,n) reactions with the modified SOURCES4 code

Friday, 4 October 2024 09:20 (20 minutes)

The sensitivity of underground experiments searching for rare events such as dark matter, neutrinoless double-beta decay or low-energy neutrinos is affected by the background due to neutrons from spontaneous fission and (α ,n) reactions. Neutron yields and energy spectra due to these reactions can be calculated using a variety of codes. In this paper we present new calculations of neutron production using the modified SOURCES4A code with recently updated cross-sections for (α ,n) reactions and the comparison of the results with available experimental data from alpha-particle beams and radioactive decay chains. The cross-sections for (α ,n) reactions used in SOURCES4 have been taken from reliable experimental data where possible, complemented by the calculations with the recent versions of EMPIRE and TALYS codes or evaluated data library JENDL-5 where the data were scarce or unavailable.

Primary authors: PARVU, Mihaela (University of Bucharest); KRAWCZUN, Piotr (University of Sheffield); KUDRYAVTSEV, Vitaly (University of Sheffield)

Presenter: KUDRYAVTSEV, Vitaly (University of Sheffield)

Session Classification: Neutron Background Mitigation