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Neutron yield calculation with SOURCES4 and comparison with other codes and experimental data

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Sensitivity of underground experiments searching for rare events due to dark matter or neutrino interactions is often limited by the background caused by neutrons from spontaneous fission and (alpha,n) reactions. A number of codes exist to calculate neutron yields and energy spectra due to these processes. Here we present the calculations of neutron production using the modified SOURCES4 code with recently updated cross-sections for (alpha,n) reactions and the comparison of the results with other codes and available experimental data. The cross-sections for (alpha,n) reactions in SOURCES4 have been taken from reliable experimental data where possible, complemented by the results of calculations with EMPIRE or TALYS codes where the data were scarce or unavailable.

We will also present a brief overview of low-background community activities to improve our knowledge of (alpha,n) reactions and associated neutron production.

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