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Calculation of the neutron production induced by radiogenic alpha-decay with Geant4

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The calculation of the neutrons produced in (alpha,xn) reactions in a certain material require the calculation of the alpha-tracks, the cross sections of the neutron production reactions involved and the energy distributions of the secondary neutron energy distributions.

All these ingredients are present in Geant4, namely the slowing down of the alpha particles (EM physics), the neutron production cross sections and secondary particle energy distributions (G4ParticleHP) based on ENDF-6 formatted data libraries and the particle and process biasing techniques.

The ParticleHP module of Geant4 has been used to model neutron production induced by radiogenic alpha decay. Several results obtained with differen tinput cross section libraries and energy spectra have been compared with other codes.

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