

Water neutron moderation of AmBe: a computational approach with Geant4

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Americium-beryllium neutron sources are proven useful in industrial, education, and research environments because of their stable neutron flux and long working life.

Neutron moderation properties of water can be characterised using this source, and thermal diffusion length and neutron age determined by using neutron flux detectors such as He3, BF3 and LiI. Given the non-linear response of these detectors, a computational framework has been set-up within Geant4. A first validation against pre-existing data by Goldstein et al. for mono-energetic neutrons has been made, to then allow characterisation of the AmBe source behaviour in water against the detector distance for proportional counters. An insight into teaching using experiments on neutron moderation that can be performed in equivalent set-ups is given.