

Investigation of double differential neutron spectra induced by the interaction of heavy ions around 10 MeV/n on thick target

Co-auteurs

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Résumé (moins de 1100 caractères)

Accelerators are being constructed for both fundamental research and industrial applications purpose. Characterizations of radiation hazards are necessary to maintain an adequate level of radiation protection. However, experimental secondary neutrons yields generated by interactions of low energy heavy ion (~10 MeV/n) are rare that represents serious issues for the design and the operation of accelerator facilities. Studies of heavy ion reactions require also a well-established library of experimental data.

An experimental campaign is being carried out at GANIL to measure double differential neutron spectra (energy, angle) generated by interactions of heavy ion beams on thick target. Two techniques of measurement are simultaneously performed: the activation method and the Time of Flight method.

Experimental analysis shows an agreement of spectra measured by the two measurement techniques. However, significant disagreements between experimental results and calculations of simulation codes (FLUKA, PHITS) have been observed that represents several consequences for accelerator facilities. This disagreement also indicates a need to improve heavy ion reaction modeling.

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