ANALYSIS OF PARTICLE DISTRIBUTION IN A DOUBLE LAYER BEAM SHAPING ASSEMBLY RESULTED FROM 30 MEV-PROTON REACTIONS WITH BERYLLIUM TARGET USING THE PHITS PROGRAM

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Title	ANALYSIS OF PARTICLE DISTRIBUTION IN A DOUBLE LAYER BEAM SHAPING ASSEMBLY RESULTED FROM 30 MEV-PROTON REACTIONS WITH BERYLLIUM TARGET USING THE PHITS PROGRAM
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Abstract	An analysis on the, distribution of particle flux emanating from reactions of 30 Mev-proton with beryilium target in a double layer beam shaping assembly (BSA) has been carried out using the PHITS program. It studies important parameters relating to the distribution of proton, neutron, and gamma. It is revealed that reactions of proton and beryllium in double layer BSA produce fast neutrons and other protons, resulting from certain reactions, and recoil protons from the interactions of fast neutrons and hydrogen atoms. Fast neutrons are distributed around beryllium target, moderator, reflector, and collimator. They are moderated by PJ and LiF material. Epitherrnal neutrons spread along the moderator, with a distribution that is tapering down as it approaches the end of the collimator (aperture). During its travel along the moderator, an epitherrnal neutron decreases in energy to become a thermal neutron. The spectrum or neutron beam produced by the double layer BSA is wide, which indicates that the neutron beam exiting the aperture consists of three kinds of neutrons, dominated by epithermal neutrons with energy range 1 eV- 10 keV.
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