GENERATION OF PULSED NEUTRON BEAM BY CHANNELING RADIATION FROM RELATIVISTIC ELECTRONS

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As is well known, the channelling radiation (CR) from sub-GeV relativistic electrons is characterized by brilliant peak in intensity at the photon energies within 1-5 MeV. These photons may lead to the photonuclear reaction (gamma, n) in the downstream target consisting of nuclei with appropriate neutron binding energy. Since the CR spectrum and its maximum position depends on the initial electron beam energy, the neutron yield is complicated function of the electron beam energy. Here, we present the results of calculations of the neutron yield generated by CR from initial electrons with energies 200 - 800...1600 MeV (SPARC Facility, LNF) channeled in a Si, Ge and W crystals, which is directed to Be or D target. The comparison with other methods of generation of fast neutron beams (with neutron energy up to several MeV) is performed, especially with so called "neutron focus in the field of synchrotron radiation"

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