Neutron induced reactions in massive spallation targets

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Abstract

In the 70s and 80s at JINR, Dubna, some experiments with massive targets consisting of fissionable nuclides irradiated with high energy proton and deuteron beams were performed. The project Energy Plus Transmutation started in the 90s. The set-up included a big Pb/U target packed in a polyethylene cage. The project developed into the next experimental set up Quinta (natU target packed in a natPb cage). All experiments aim to study the neutron field generated in the targets by neutron induced reactions. The paper considers the neutron induced fission and capture reactions for different neutron shielding and neutron modulators and set ups.