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#10-138 A Monte Carlo Study of Radiation Resistant Materials using JA-IPU Code for IV Generation Nuclear Energy Systems

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A Monte Carlo simulation study of four tentative radiation resistant materials (RRMs) at energies corresponding to proposed DT-neutron source up to 15 MeV using the JA-IPU code has been presented. The code incorporates full cascade development of both projectile neutron and energetic knocked on recoiling atoms. The code involves basic processes of elastic collision and ionization loss as well as many other practical features such as escape out, displaced number of atoms and damage energy cross section, $\langle \sigma T_{dam} \rangle$ in b.keV by an imparted neutron. In the code exclusive shielding features can be developed. From the preliminary results presented in this paper, it is revealed that the data of $\langle \sigma T_{dam} \rangle$ in b.keV estimated for SiC is smaller than Zr₃Si₂ RRMs. Also, SiC shows better neutron reflection characteristic using simulated results of B/F ratio in comparison to the Zr₃Si₂ and V-alloy and AlN ceramics. From the DPA study also, SiC and V-alloy are better than Zr₃Si₂ and AlN. The study is useful for the development of manpower and data development for the IV generation nuclear energy systems.

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