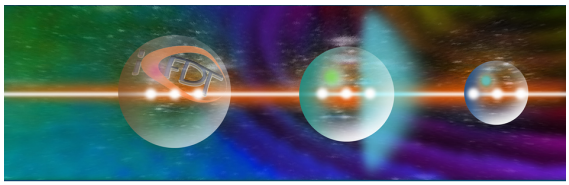

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Simulating Fission Fragments for Advanced Energy Applications

Tuesday, 22 October 2024 18:05 (1 hour)

This study explores the possibility of using a neutron source that fissions a fissile thin layer, this last is used to cover a tank full of light gas. It's possible to exploit the released energy of the reaction and from the same fission products for various applications (e.g. spatial propulsion, hybrid reactors etc.) not argued in this work. A dedicated Monte Carlo model simulating fission events in a U235 target layer is presented. The model characterizes each event by a set of key parameters of the produced fission fragments, specifically focused on their energy distribution. These generated parameters are compared with established nuclear transport codes to ensure consistency. The model demonstrates its accuracy by reproducing experimental distributions of critical parameters involved in the fission process.
An initial analysis of the behavior of FFs in a physical structure is addressed. This structure, designed as a thin slab containing a support structure and a light gas, represents a practical step toward designing a containment tank for energy collection. The analysis also investigates here the interaction of fission fragments with the different materials and their energy deposition patterns. This work then lays the groundwork for further investigation into the use of fission fragments for energy transfer applications, potentially contributing to the development of innovative propulsion systems.

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