Transient effects in proton-induced fission of ^{208}Pb

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Peripheral heavy-ion collisions at relativistic energies represent an appropriate scenario to investigate the transient and nuclear dissipation effects on fissile systems. Using a new experimental approach [1,2], the de-excitation of the system and its degrees of freedom are studied. A dedicated experimental set-up using the inverse kinematics technique [3] make it possible to identify in atomic number both fission fragments simultaneously with high resolution and reconstruct the charge of the fissioning system. In this approach, the width of the fission-fragment nuclear charge distribution depends on the excitation energy of the system, and therefore, on its temperature at the saddle point (Tsad). These observables are compared with nuclear-reaction codes to extrapolate quantitative results concerning the strength of the dissipation coefficient and transient time of the system. In this work, we have investigated transient and dissipation effects in proton and deuteron induced fission on ^{208}Pb at 500 A MeV using these new experimental signatures. A comparison between different reaction codes was made to stress the main differences between them. For this purpose we used as a excitation stage ABRA (BURST) [4], INCL [5] and ISABEL [6]. For the de-excitation stage we used ABLA [4] and GEMINI++ [7]. The obtained results are consistent with other works showing the influence of the transient time and the nuclear dissipation in the fission process at high excitation energy [9].

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