SIMULATION WITH PLACA/DPLACA OF THERMAL AND MECHANICAL PHENOMENA IN MONOLITHIC AND DISPERSED FUEL PLATES

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ABSTRACT

The codes PLACA and DPLACA simulate the irradiation behavior of fuels for research reactors under normal operation conditions. They represent, respectively, plate-type fuels of the monolithic and dispersed types. Both codes contain about thirty interconnected and mutually dependent models structured in a modular scheme. This characteristic gives to the codes a large versatility. To simulate U-Mo/Al dispersion fuels, where the growth of an interaction layer can provoke uncontrolled swelling, a diffusion model with two moving boundaries has been developed. It assumes that the kinetics of both layer boundaries is determined by diffusion of U and Al through the layer. The codes make possible a detailed simulation of the evolution of the more relevant physical parameters of a fuel plate during its permanence within a reactor. Both codes were applied to simulate irradiation histories for which experimental data are available. The good quality of the codes predictions reveals the correct performance of the models involved and the appropriate coupling of the ensemble.