PULSED NEUTRON SOURCE MEASUREMENTS OF KINETIC PARAMETERS IN THE SOURCE-DRIVEN FAST SUBCRITICAL CORE MASURCA

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In the framework of the European 5FP MUSE\textsuperscript{(1)} project, measurements are being performed to investigate the neutronic behavior of the fast subcritical core MASURCA coupled with the GENEPI accelerator. The most direct method to study the response of the system to source intensity variations, is to inject a short neutron pulse and record the counting rate following the pulse of detectors distributed on different reactor positions. With the help of GENEPI neutron pulses, less than 1μs wide, have been generated in the center of MASURCA with frequencies of 0.5 to 4 kHz, and the subsequent neutron flux has been observed by detectors based on $^{235}$U and $^{237}$Np fission placed in the core, reflector and shielding regions of MASURCA. Different core configurations, corresponding to different levels of subcriticality, have been explored. The results of these measurements are presented in this paper. Several analyses have been performed to extract information of the reactivity of the MASURCA configurations from the analysis of the prompt nearly exponential decay, measuring either the reactor α value, reactivity in dollars, or the prompt neutron multiplication.

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