



Iranian Journal of Physics Research, Vol. 10, No. 1, 2010

Investigation of reactivity changes due to flooding the irradiation sites of the MNSR reactor using the MCNP code and comparison with experimental results

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(Received 3 November 2009 ; in final form 20 April 2010)

Abstract

In this work, the Isfahan Miniature Neutron Source Reactor (MNSR) has been simulated using the MCNP code, and reactivity worth of flooding the inner irradiation sites of this reactor in an accident has been calculated. Also, by inserting polyethylene capsules containing water inside the inner irradiation sites, reactivity changes of this reactor in same such accident have been measured, the results of which are in good agreements with the calculated results. In this work, the reactivity worth due to flooding one inner irradiation site is 0.53mk , and reactivity worth due to flooding of the whole 5 inner irradiation sites is 2.61 mk.

Keywords: MCNP code, Monte Carlo simulation, reactivity, MNSR reactor

For the full article refer to the Persian section