

THE ABSOLUTE THERMAL NEUTRON FLUX MEASUREMENT IN THE RESEARCH
REACTOR "RA" BY THE NEUTRON ACTIVATION METHOD

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Well defined power distribution is of great importance for safe and economical reactor operation. It can be determined by spatial neutron flux distribution. The neutron flux is also an important exploitation characteristic of research reactors.

The absolute thermal neutron flux measurement procedure, applied to the research reactor RA at Vinča, is presented. This procedure is based on the neutron activation method. The Au and Dy-Al foils and wires were used as activation detectors. The following measuring equipment was used: a 4- π beta proportional counter (to measure the absolute Au foils' activity), a GM counter (for relative neutron flux distribution determination) and a gamma spectrometer with Ge(Li) detector (for impurity content determination).

It has been shown that the absolute neutron flux determination procedure based on foil activation at the small reactor power level, corrected by nominal to small reactor power ratio, is inherently not precise enough.

It has also been shown that the used^{‡‡} "diluted" (Dy (Dy-Al) activation detectors are suitable for absolute neutron flux measurement in the reactor RA at the nominal reactor power level as well as that the applicability of activation detectors of this type might depend considerably on nuclear properties of impurities.

Regarding the neutron flux and specific power in the reactor RA the obtained results may also be useful for power reactors.

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