

Overview of Accelerator Driven Systems and Spallation Neutron Sources Research in Joint Institute for Nuclear Research Dubna and plans for the future

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Abstract

Unfortunately, only few researchers know, that in Joint Institute for Nuclear Research is the ADS program, which lasts continuously from nineties till now. Several status reports were published by IAEA and other institutes, usually only SAD (Subcritical Assembly in Dubna) – never realized plan of ADS mock-up is published there, when JINR Dubna is mentioned. However, there were several facilities designed and constructed and irradiated for several times. Some of them were just thick spallation sources from lead, either pure or surrounded by paraffin or graphite; the other two were fast uranium blankets with lead (and uranium) targets inside. Facilities were irradiated with protons from 0.66 GeV up to 2 GeV, by deuterons up to 7 GeV and also by C-12 ions. Various neutron/proton field quantities were studied, like neutron production, neutron spatial distribution, neutron energy distribution, total neutron escape, neutron and power multiplicity, etc. At the moment 20 ton quasi-infinite depleted uranium blanket is ready to irradiation by 0.66 GeV protons; lead, uranium, thorium, or bismuth targets are available for the blanket.