

COLD NEUTRON SOURCES FOR APPLICATIONS AT RESEARCH REACTORS AND ACCELERATORS

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ABSTRACT

In order to study the possibility to build cold neutron sources in Brazilian research reactors and in the IEAv/CTA electron accelerator, several Monte Carlo simulations were made considering the Argonaut research reactor of IEN/CNEN and the IPR-1 research reactor of CDTN/CNEN. Neutron flux calculations were performed at normal (297K), liquid nitrogen (77K), liquid hydrogen (20K), and liquid helium (4K) temperatures for a graphite medium and mixtures of light and heavy water, which are the available moderators for a future experimental program. Applications in the areas of fundamental research, Nuclear Engineering and Physics, Medicine, Biology, Geology, Metallurgy and Material Sciences, Industry and Agriculture were also presented.

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