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# Characterization of the New CCD Camera for Neutron Tomography at the Thai Research Reactor-1/Modification 1

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Neutron tomography is a method to investigate a sample via a three dimensional (3D) image produced by neutron absorption. It is widely applied in many fields such as, medical, industrial and archeological. By reconstructing 2D images taken from different angles, the 3D information can be created. In order to obtain a 2D image of which the quality is good enough for neutron tomography with a short period of irradiation, a high efficiency neutron camera is needed. The aim of this research is to characterize the new CCD camera for neutron tomography at the Thai Research Reactor-1/Modification 1 (TRR-1/M1). The neutron camera manufactured by NeutronOptics is composed of three main parts: the Kodak KAI-4022 CCD with 2048×2048 pixel resolution, the Nikkor f/1.2 lens with the focal length of 50 mm and the Lithium Fluorine-Zinc Sulphide (LiF-ZnS) scintillation screen. The experimental investigation was performed at the radiographic position of 100 cm from the neutron beam port of TRR-1/M1. Thermal neutron flux at this position is about 10^6 n.cm-2s-1. At first, the sensitivity indicator (SI) standard sample and the in-house acrylic step wedge were radiographed to evaluate the sensitivity and the resolution of the camera. Then, the exposure time and the distance were varied to determine appropriate exposure conditions. The obtained images from the new CCD camera were analyzed using ImageJ software. Detailed results and discussion of this investigation will be presented in the manuscript.

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