Neutron Imaging by Cyclotron based on Neutron Source

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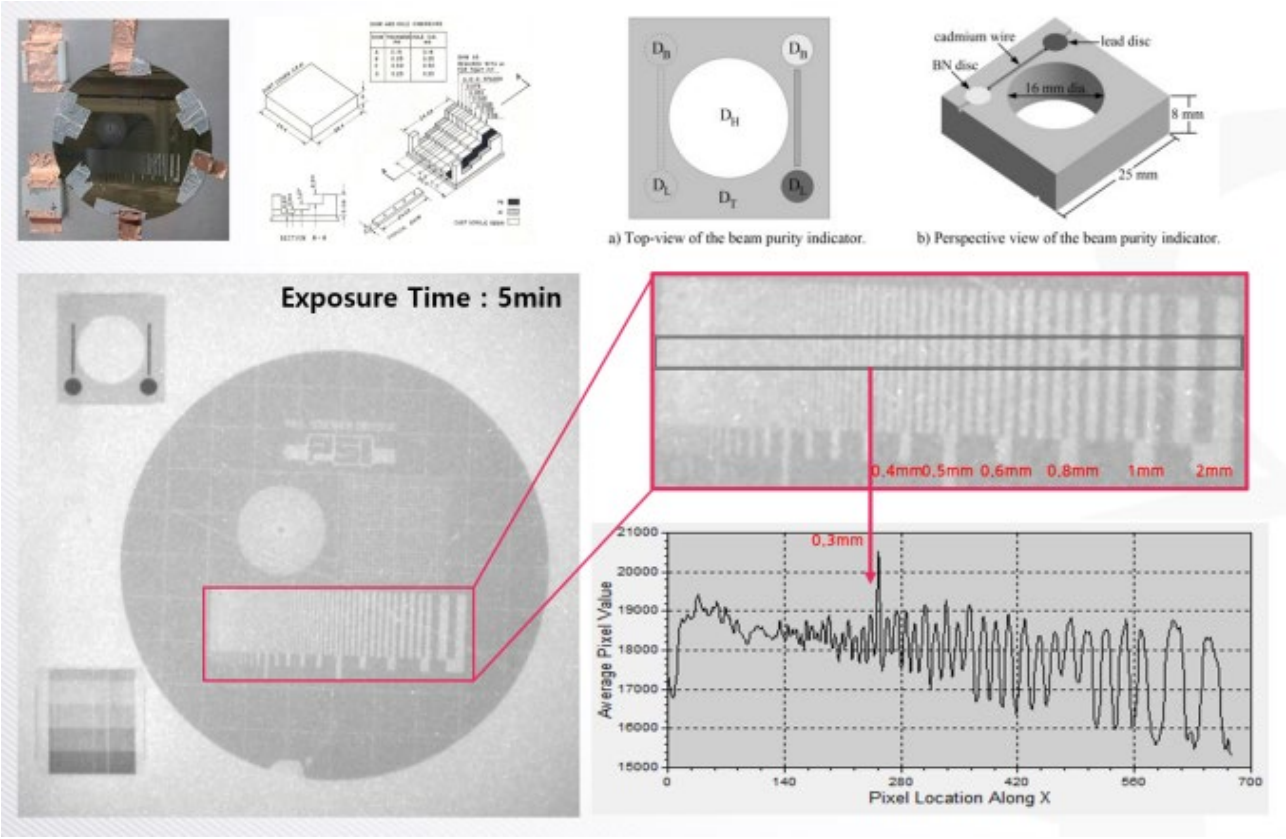
Because neutron imaging require a relatively high neutron flux, the HANARO is the only neutron facility in Korea. Many users have reported difficulties in accessing the HANARO facility, and it takes a long time to retrieve their samples. We tried to develop a new neutron source based on a 30 MeV proton cyclotron at the Jeong-eup site. The 30 MeV cyclotron has an output current of 0.1 mA, it can produce up to 10^13 n/s or more neutrons. We have developed all components for neutron imaging: Be target, HDPE moderator, reflector, shielding and imaging acquisition system. Although the cyclotron output current was limited to 0.01 mA due to the radiation of the coolant by neutron activation, we produced more than 10^12 n/s neutrons and successfully acquire neutron imaging. We will present the characteristics of neutron sources, image qualities and future plans.



Neutron Images of beam purity indicator, sensitivity indicator and resolution indicator