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## Fast Neutron Imaging Capability at NOBORU and RADEN of J-PARC

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Neutron beamlines of the Materials and Life science experimental Facility (MLF) utilizes short-pulsed neutrons produced by 3-GeV proton beam irradiation at the Japan Proton Accelerator Research Complex (J-PARC). The most probable energy of neutrons produced in spallation reactions is around ~ MeV although high energy neutrons up to ~ GeV are also produced. Two beamlines, NOBORU and RADEN, are available to utilize such fast neutrons for imaging experiments. Massive steel collimators, filters to reduce the prompt gamma-ray produced at the moment of proton pulse injection, and thick shields of sample room are equipped to utilize wide neutron-energy-range. The neutron's penetration power, generally increases with its energy, is expected to provide a unique capability for non-destructive inspection of large objects or high neutron absorbing materials: architectural and civil engineering structures, simulated melted core material containing boron, etc.

In this presentation the characteristics of NOBORU and RADEN are discussed from a viewpoint of neutron imaging with higher energy neutrons. Then some results of imaging with neutrons between 0.5 eV and ~MeV are presented. The authors also introduce an activity of developing a neutron imaging detector based on a lithium glass scintillator and a multi-anode photomultiplier tube to obtain a high efficiency at higher energies.

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