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Measurement of cold neutron spectrum by multi-foil activation method TATSUYA KIKAWA, TRIUMF, CANADA-JAPAN UCN COLLABORATION — In 2016, we will start commissioning the ultracold neutron (UCN) source at TRIUMF: the proton beamline including the spallation target, as well as the cold neutron moderators will be tested. In order to gain a better understanding of the UCN production, a measurement of the cold neutron flux in the UCN source is needed. However, a measurement with the time-of-flight (TOF) method is not adaptable to our geometry. Thus, we are planning to measure the cold neutron spectrum using multiple neutron activation foils with unfolding technique. We will place special foils in the (empty) UCN production volume to measure the neutron spectrum; their activities will be measured by Ge detectors after the activation. The neutron spectrum is reconstructed from the measured activities by an unfolding analysis. This technique has been conventionally used for the measurement of the fast neutron spectrum. In this presentation, we will explain the application of this technique to the measurement of cold neutron spectrum and the status of preparations for the measurement at TRIUMF.

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