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## Experimental Setup for Neutron Pulse Measurement at Early-stage ESS Test Beamline

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A dedicated test beamline (TBL) is being built to provision the commissioning of the ESS spallation source. The functionality of the beamline employs “camera obscura” principle, which allows to observe both thermal and cold neutrons emitted from different parts of the so-called *butterfly moderator*. The layout of TBL simply consists of a tapered collimator and a changeable pinhole with diameters of 1-10 mm. During the early stage of commissioning, the proton energy will be 570 MeV, corresponding to 100 kW and expectedly generate thermal-cold flux of  $10^{5-2}$  n/cm<sup>2</sup>/s on the TBL instrument. Besides the spatial neutron emission, this contribution will detail how the neutron pulse shapes will be measured, e.g. by Bragg diffraction from a monochromator crystal, Bragg dip transmission or the *pinhole time-of-flight method*.

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