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## Fabrication of Prototype vuv Spectrometer & Liquid Target System Containing Hydrogen

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The vuv spectrometer for ITER main plasma measurement is designed as a five-channel spectral system. To develop and verify the design, a two-channel prototype system was fabricated with No. 3 (14.4-31.8 nm) and No. 4 (29.0-60.0 nm) among the five channels. For test of the prototype system, a hollow cathode lamp is used as a light source. The system is composed of a collimating mirror to collect the light from source to slit, and two holographic diffraction gratings with toroidal geometry to diffract and also to collimate the light from the common slit to detectors. The overall system performance was verified by comparing the measured spectral resolutions with the calculated spectral resolutions. And we also have developed liquid jet target system. This study is about a neutron generator, which is designed to overcome many of the limitations of traditional beam-target neutron generators by utilizing a liquid target. One of the most critical aspects of the beam-target neutron generator is the target integrity under the beam exposure. A liquid target can be a good solution to overcome damage to the target such as target erosion and depletion of hydrogen isotopes in the active layer, especially for the ones operating at high neutron fluxes and maintained relatively thin with no need for water cooling. In this study, liquid target containing hydrogen has been developed and tested.

**Keywords:** vuv spectrometer, Liquid jet, Neutron source