

Development of a Collective Thomson Scattering Diagnostic System on SNU X-pinch device

Jongmin Lee^{1*}, Jung-Hwa Kim¹, Sungbin Park¹, Yong-sung You², Jae-seok Lee², Y.-c. Ghim²,
and Y. S. Hwang¹

¹*Department of Nuclear Engineering, Seoul National University
Seoul, 08826, Republic of Korea*

²*Department of Nuclear and Quantum Engineering, KAIST,
Daejeon, 34141, Republic of Korea*

The Collective Thomson Scattering (CTS) diagnostic system has been developed for the X-pinch device at Seoul National University [1]. The system is designed to measure various parameters of plasma jets, including ion temperature and plasma flow velocity. For the flow velocity measurement, the second harmonic Nd:YAG laser (1.0J, 8ns, 532nm) and the collection optics are oriented in order to ensure the scattering vector is aligned with the flow direction. The collection optics have been optimized to maximize photon efficiency. Due to the requirement of high spectral resolution for the diagnosis of CTS spectra, the spectrometer is designed with a resolution of 0.004 nm/pixel. In addition, rotational Raman scattering is measured for wavelength calibration of the spectrometer. The CTS diagnostic system will contribute to a deeper understanding of X-pinch plasma dynamics and the development of advanced High Energy Density Plasma (HEDP)-based technologies.

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*Presenting author: jmlee812@snu.ac.kr