

Abstract Submitted  
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**Development of Experimental System for Optical Vortex Laser Absorption Spectroscopy**<sup>1</sup> SHOMA ASAI, Nagoya University, SHINJI YOSHIMURA, National Institute for Fusion Science, MITSUTOSHI ARAMAKI, Nihon University, NAOYA OZAWA, Nagoya University, KENICHIRO TERASAKA, MASAYOSHI TANAKA, Kyushu University, TOMOHIRO MORISAKI, National Institute for Fusion Science — We have been developing a new diagnostics using optical vortex for a linear ECR plasma device named HYPER-I at the National Institute for Fusion Science, Japan. Optical vortex is realized in laboratory as a cylindrically symmetric propagation mode of light beam known as the Laguerre-Gaussian (LG) mode. An atom moving in the LG beam is subjected to an additional azimuthal Doppler shift in contrast to conventionally used Hermite-Gaussian (HG) beams in which the atom experiences the axial Doppler shift alone. Therefore, it is promising that laser spectroscopy using LG beams have a sensitivity for traversing motion across the light path. Although there are several methods to produce optical vortex, we have adopted the holographic method due to its controllability. In the holographic method, the LG beams are obtained as the first-order diffracted light from the hologram displayed on the spatial light modulator. The quality of LG beams has been improved to be applied to optical vortex laser absorption spectroscopy by optimizing the hologram. The details of experimental system will be reported at the meeting.

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