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Initial Results of Optical Vortex Laser Absorption Spectroscopy in the HYPER-I Device[1] SHINJI YOSHIMURA, National Institute for Fusion Science, SHOMA ASAI, Nagoya University, MITSUTOSHI ARAMAKI, Nihon University, KENICHIRO TERASAKA, Kyushu University, NAOYA OZAWA, Nagoya University, MASAYOSHI TANAKA, Kyushu University, TOMOHIRO MORISAKI, National Institute for Fusion Science — Optical vortex beams have a potential to make a new Doppler measurement, because not only parallel but perpendicular movement of atoms against the beam axis causes the Doppler shift of their resonant absorption frequency. As the first step of a proof-of-principle experiment, we have performed the optical vortex laser absorption spectroscopy for metastable argon neutrals in an ECR plasma produced in the HYPER-I device at the National Institute for Fusion Science, Japan. An external cavity diode laser (TOPTICA, DL100) of which center wavelength was 696.735 nm in vacuum was used for the light source. The Hermite-Gaussian (HG) beam was converted into the Laguerre-Gaussian (LG) beam (optical vortex) by a computer-generated hologram displayed on the spatial light modulator (Hamamatsu, LCOS-SLM X10468-07). In order to make fast neutral flow across the LG beam, a high speed solenoid valve system was installed on the HYPER-I device. Initial results including the comparison of absorption spectra for HG and LG beams will be presented.

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