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Measurement of neutral flow velocity field associated with an anti- $E \times B$ vortex KOHEI OGIWARA, Kyushu University, MITSUTOSHI ARAMAKI, Nagoya University, SHINJI YOSHIMURA, National Institute for Fusion Science, MASAYOSHI Y. TANAKA, Kyushu University — Recently, a class of vortices, which rotate opposite to the direction of $E \times B$ drift, have been observed in a magnetized plasma. It is considered that this vortex is driven by the force generated through the momentum transfer due to charge exchange collisions between ions and neutrals. To confirm the mechanism of the vortex formation, we have developed a high resolution LIF system and measured the neutral flow velocity field, in which the LIF system with an extended cavity diode laser is combined with saturated absorption spectroscopy to achieve high wavelength resolution (± 5 fm). The LIF spectra of argon metastable atoms have been measured by tuning the laser wavelength to 696.735 nm and detecting the fluorescence photons of 826.679 nm. The neutral flow velocity field has been visualized for the first time. It is found that the radial flow is directed to the center of vortex with its maximum velocity of about 40 m/s. The direction of the azimuthal rotation is the same as that of the ion flow.

Kohei Ogiwara
Kyushu University

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