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Ion flow field of a rotating plasma in a diverging magnetic field¹ KENICHIRO TERASAKA, Kyushu University, SHINJI YOSHIMURA, National Institute for Fusion Science, MITSUTOSHI ARAMAKI, Nagoya University, YUKI SAKAMOTO, MASAYOSHI Y. TANAKA, Kyushu University — We are interested in plasma flow structure in weak magnetic field, in which the ions are unmagnetized. We have measured the flow field in an ECR plasma of the HYPER-I device at the National Institute for Fusion Science. The experimental evidence of ion stream line detachment (non-adiabatic detachment) form the magnetic field was observed by measuring the ion flow velocity in a diverging magnetic field region. In the detachment region, the characteristic of ion flow field is different from that of magnetized plasma, showing that the total angular momentum given by the sum of both the plasma and the electromagnetic field contributions is important. In order to clearly understand the mechanism of flow structure formation in diverging magnetic field, further experiments in the weaker magnetic field region is needed. We have developed a new experimental device (HYPER-II) at Kyushu University. The new device allows ion flow measurement in the lower magnetic field region of the order of 10 Gauss. The experimental results of the HYPER-I device and the preliminary results of the HYPER-II device will be presented.

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