

Abstract Submitted
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Investigation of Ion Heating Mechanism of Magnetic Reconnection by Use of Tomographic 2-D Ion Doppler Diagnostics¹ HIROSHI TANABE, AKIHIRO KUWAHATA, SETTHIVOINE YOU, Univ. Washington, HIROTAKA OKA, PATRICK COPINGER, SHINGO ITO, YOSHINORI HAYASHI, TORU II, ALEXANDAR BALANDIN, MICHIAKI INOMOTO, YASUSHI ONO — The TS-3 and TS-4 experiments at the University of Tokyo collides two tokamaks and spheromaks with co- and counter- helicities to form single high beta compact toroid. The ion temperature after the reconnection was found to increase with decreasing toroidal magnetic field, indicating strong dependence of ion heating effect on toroidal magnetic field. To investigate more detailed heating characteristics, we have developed 2-D local ion temperature measurement system by means of tomographic reconstruction for ion Doppler spectroscopy. We are now developing novel 2-D local ion toroidal flow diagnostics by use of the conversion technique of vector radon transform into scalar radon transform of flow vector potential [1]. After the quality of inversion results were tested by reconstruction simulation, the whole measurement system was installed on TS-3 and TS-4. The measured 2-D images of ion flow and temperature revealed the local ion acceleration and heating of magnetic reconnection - the ion heating by reconnection outflow.

[1] A. L. Balandin et al, Eur. Phys. J. D, 27, 125, 2003

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