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ELM Rotation Measurement via the NSTX FIRETIP System¹

M. JOHNSON, K.C. LEE, C.W. DOMIER, N.C. LUHMANN, JR., University of California at Davis, H. PARK, Princeton Plasma Physics Laboratory, R. MAINGI, Oak Ridge National Laboratory — The high time resolution of the Far Infrared Tangential Interferometer/Polarimeter (FIRETIP) allows measurement of the critical parameters of the small Edge Localized Modes (ELMs), also known as a type V ELM, on the National Spherical Tokamak Experiment (NSTX) including the speed of rotation and size of each ELM structure. Understanding of ELMs is extremely important since the operation mode of future fusion devices such as ITER is likely an ELM free high confinement mode (H-mode). An extensive analysis of the type V ELM data demonstrates a strong relationship between the rotation speed and interval of the ELM. This paper includes the upgrade process of the multi-channel FIRETIP system and implications of the ELM physics by its rotation measurements.

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