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Correlation Between ELM Average SOL Velocities, ELM Sizes, and Pedestal Temperatures and Gradients in NSTX R.Q. MAINGI, Rutgers Univ. and PPPL, T.K. GRAY, ORISE and ORNL, R. MAINGI, ORNL — Edge Localized Modes (ELMs) are an area of concern for devices operating in an H-mode regime, as they result in high periodic heat and particle fluxes that can damage plasma facing components. ELMs are believed to be caused by the peeling and /or ballooning MHD instabilities, which eject hot particles from the top of the H-mode pedestal into the scrape-off layer (SOL). Electrons ejected by ELMs travel to the targets in < 10 μsec, which is difficult to measure. On the other hand, ions ejected by the ELMs are transported through the SOL in 100-1000 μsec, at velocities near their sound or acoustic speed, which should be dependent on the pedestal ion temperature, T_i^{ped}. The average speed parallel to the magnetic field can be computed from experimental data by dividing the difference in the magnetic connection length from the outer midplane to the outer and inner targets in the SOL by the ELM in-out Dα delay time, i.e. the difference in time of the ELM flux reaching the outer and inner diverter strike points. Here, we compare the calculated average speeds of the ELM fluxes to the T_i^{ped} and its gradient. We further compare these pedestal parameters and in/out delay times to measures of the ELM size, e.g. percent changes in density and stored energy. *Supported in part by U.S. DoE contracts DE-AC05-00OR22725 and DE-AC02-09CH11466.

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