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Atomic Hydrogen Measurements in a Fusion-Relevant Plasma CAMERON SAMUELL, CORMAC CORR, Australian National University, PLASMA RESEARCH LABORATORIES TEAM — Critical to the success of large-scale fusion reactors is the development of new materials that can withstand the extreme conditions at the plasma-surface boundary. The materials required for plasma-facing components will need to withstand a very aggressive environment that is characterized by both a high heat load and high ion flux produced by the hydrogen isotope plasma. As such, investigating the ways in which hydrogen plasmas interact with a range of materials is an important area for research and development and is vital to the future success of fusion. A new experimental reactor, the MAGnetized Plasma Interaction Experiment (MAGPIE), has been constructed at the Australian National University to help resolve some of the critical issues surrounding the choice of fusion reactor materials. MAGPIE is a linear system with a 2.5kW, 13.56MHz helicon source that operates in a magnetic hill configuration with field strengths up to 0.19T. Densities up to $10^{19}\mathrm{m}^{-3}$ at temperatures < 5eV have been achieved. The focus of this presentation is the interaction between a magnetized hydrogen plasma and tungsten and graphite targets in MAGPIE. Results from two-photon absorption laser induced fluorescence (TALIF), optical emission spectroscopy (OES) and probe diagnostics will be presented.

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