Abstract Submitted
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Studies of Impurities in the Pegasus Spherical Tokamak[1] C. RODRIGUEZ SANCHEZ, G.M. BODNER, M.W. BONGARD, M.G. BURKE, R.J. FONCK, J.M. PERRY, J.A. REUSCH, J.D. WEBERSKI, University of Wisconsin-Madison — Local Helicity Injection (LHI) is used to initiate ST plasmas without a solenoid. Testing predictive models for the evolution of $I_p(t)$ during LHI requires measurement of the plasma resistivity to quantify the dissipation of helicity. To that end, three diagnostic systems are coupled with an impurity transport model to quantify plasma contaminants. These are: visible bremsstrahlung (VB) spectroscopy; bolometry; and VUV spectroscopy. A spectral survey has been performed to identify line-free regions for VB measurements in the visible. Initial VB measurements are obtained with a single sightline through the plasma, and will be expanded to an imaging array to provide spatial resolution. A SPRED multichannel VUV spectrometer is being upgraded to provide high-speed ($\sim$ 0.2 ms) spectral surveys for ion species identification, with a high-resolution grating installed for metallic line identification. A 16-channel thinistor bolometer array is planned. Absolutely calibrated VB, bolometer measurements, and qualitative ion species identification from SPRED are used as constraints in an impurity transport code to estimate absolute impurity content. Earlier work using this general approach indicated $Z_{eff} < 3$, before the edge current sources were shielded to reduce plasma-injector interactions.

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