

Abstract Submitted
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The He/Ne beam diagnostic for line ratio spectroscopy in the Island Divertor of Wendelstein 7-X E. FLOM, T. BARBUI, F. EFFENBERG, O. SCHMITZ, University of Wisconsin - Madison, M. JAKUBOWSKI, M. KRYCHOWIAK, R. KOENIG, S. KWAK, Max Planck Institute for Plasma Physics, S. LOCH, Auburn University, J. MUOZ BURGOS, Astro Fusion Spectre, J. SVENSSON, Max Planck Institute for Plasma Physics, THE W7-X TEAM TEAM — A line-ratio spectroscopy system based on thermal helium (He) and neon (Ne) collisional-radiative models (CRM) enables measurement of n_e and T_e in front of the horizontal divertor target of the Wendelstein 7-X optimized stellarator. Spectral line emission from locally-injected helium and neon is channeled to multiple 20cm and 32cm Czerny-Turner spectrometers, allowing high spectral resolution observation of diagnostic helium and neon lines, as well as various visible impurity lines and Balmer series lines. In this work, T_e and n_e profiles across the divertor island are shown for a variety of experimental conditions, including impurity-seeded and detached plasmas. Profiles inferred from neon and helium are presented and compared. Also presented are first-time measurements of plasma parameters over changing island sizes. Systematic variations of the island size in front of the diagnostic have a marked impact on the profile shape and gradients. These first-time measurements provide evidence of for a local confinement in the islands of the divertor at W7-X.

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