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Evaluation and Implementation of Helium Line Ratio Technique for Measurement of Edge Density and Temperature on DIII-D,* L. Hurd, *Clemson U.*, N.H. Brooks, *GA*; E.A. Unterberg, *ORISE*; O. Schmitz, *FZ-Juelich* — The electron density and temperature in the scrape-off layer of DIII-D have been determined in pure helium plasmas by the helium line ratio technique [1] employing spectral line monitors and an intensified fast-framing CCD camera. Both diagnostics viewed the plasma tangentially on the midplane of the vessel. Three visible He I transitions, one triplet ($3^3S \rightarrow 2^3P$) and two singlets ($3^1D \rightarrow 2^1P$ and $3^1S \rightarrow 2^1P$), were measured simultaneously – along a single spatial chord with the line monitors and over a 2D region of the outer midplane with the intensified camera. Column brightnesses through the emission shell recorded with the camera were Abel-inverted to yield local intensities with a spatial resolution of a few millimeters. The electron densities and temperatures deduced by the helium line ratio method are compared with results from the Thomson scattering diagnostic on DIII-D.

[1] O. Schmitz et al., Plasma Phys. Control. Fusion **50** (2008) 115004.

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