## Abstract Submitted for the DPP97 Meeting of The American Physical Society

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Deuterium Recombination in the DIII–D Divertor<sup>1</sup> R.C. ISLER, Oak Ridge National Laboratory, N.H. BROOKS, W.P. WEST, General Atomics, G.R. MCKEE, U. of Wisconsin, M.E. FEN-STERMACHER, R.D. WOOD, Lawrence Livermore National Laboratory — Deuterium recombination has been investigated in the DIII–D divertor by comparing spectral line ratios from attached and detached plasmas with the theoretical ratios expected under either ionizing or recombining conditions. The results indicate that the mechanism for production of the emission changes from collisional excitation of atomic deuterium to a mixture of collisional-radiative recombination and collisional excitation as plasmas evolve from attached to detached states. This conclusion is supported by observations that the electron temperature falls below 1.5 eV over much of the divertor, the D- $\alpha$  profiles from CCD cameras are correlated with the low-temperature regions, and the deuterium atom temperatures are of the order of 1 eV. The effectivness of volume recombination for neutralizing divertor plasmas will be discused with reference to parallel flow measurements obtained from Doppler shifts of spectral lines.

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Prefer Oral Session Prefer Poster Session R.C. Isler isler@FED.ORNL.GOV Oak Ridge National Laboratory

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