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**Ion Temperature Measurements in the DIII-D Divertor**<sup>1</sup> N.H. BROOKS, General Atomics, R.C. ISLER, G.R. MCKEE, Oak Ridge National Laboratory, S. TUGARINOV, TRINTI Laboratory — Doppler profile measurements of the  $D_\alpha$ , He II, C II and C III line emission in the DIII-D divertor have been performed with two high resolution spectrometers: an instrument of Russian design with high optical throughput and 7 ms readout, and a conventional Czerny Turner spectrometer with slower response time, but greater dynamic range in its detector system. In continuous ELMing H-mode plasmas the Doppler profiles are usually single-gaussian, but during operation at low density or during large, discrete ELM events the profiles of the hydrogen-like species are often multi-gaussian. Comparison of ion temperatures inferred from the single-gaussian profiles and electron temperatures measured by Thomson scattering and by spectroscopic line ratio methods yields good agreement for the higher charge states, where equilibration of ion and electron temperatures is expected. When strong  $D_2$  puffing triggers the MARFE-like conditions of Partially Detached Divertor plasmas, the  $D_\alpha$  line profile, usually a complex asymmetric profile with multiple components, evolves into a single-gaussian profile fitted by a very low temperature ( $<2$  eV) similar to that measured for the electrons by Thomson scattering.

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- Prefer Oral Session  
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