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[ ] Theory [X] Experiment

New Fast-Ion D_α (FIDA) Capabilities,* C. Muscatello, W.W. Heidbrink, D. Liu, E. Ruskov, *UC Irvine*, K.H. Burrell, D.A. Taussig, M.A. Van Zeeland, *GA* – FIDA is a charge-exchange recombination spectroscopy measurement that exploits the large Doppler shift of Balmer-alpha (D_α) light from energetic ions to infer properties of the fast ions. Validation of the first-generation version of the diagnostic (1G) was obtained independently by several diagnostics and a FIDA simulation code. This code has been generalized to easily treat new installations and is freely available for use elsewhere; neutral particle analyzer signals are also predicted. Unlike the 1G instrument whose measurement extent includes the blue and red-shifted wing, the new instrument (2G) will measure only the blue end resulting from co-circulating ions. The views for the 2G system have a toroidal component which, in conjunction with those of 1G, will extend the coverage of the fast-ion velocity space. In addition to having higher time-resolution, the new instrument also includes another level of background-signal monitoring. Along with tracking temporal changes in the background signal as with the old instrument, 2G FIDA will also have the capability of monitoring the signal from a toroidally displaced reference view.

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