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Analysis of Fiber-Optic Spectroscopic Measurements on the Compact Toroid Injection Experiment (CTIX)[1] DANIEL MOSER, University of Virginia/UC Davis, ROBERT HORTON, DAVID HWANG, RUTH KLAUSER, University of California, Davis — Spectroscopic analysis of accelerated plasmas, such as those created in CTIX, can be used to determine plasma impurity content, density and temperature via line ratios, and velocity via asymmetric Doppler shifting. Optical fibers have been installed at various locations around the CTIX plasma and connected to a visible spectrometer. The fibers can be distributed by axially, radially or by orientation. An intensified charge-coupled camera is used to view the spectrometer output with $\sim$1.0 Å resolution. By vertically stacking the fibers, multiple viewing locations can be monitored simultaneously. To interpret the raw camera data, new software has been developed to process the camera image as a lattice where rows correspond to fiber positions, and columns to wavelengths. By simultaneously acquiring multiple fiber positions, errors arising from shot-to-shot plasma variations are eliminated and the overall amount of spectral data per plasma shot is increased. Specifics on data processing and analysis techniques as well as preliminary results obtained on CTIX will be presented.

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