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Continued Development of Python-Based Thomson Data Analysis and Associated Visualization Tool for NSTX-U[1] WILLIAM WALLACE, Laney College, Oakland, California, JARED MILLER, Northeastern University, AHMED DIALLO, Princeton Plasma Physics Laboratory — MultiPoint Thomson Scattering (MPTS) is an established, accurate method of finding the temperature, density, and pressure of a magnetically confined plasma. Two Nd:YAG (1064 nm) lasers are fired into the plasma with a effective frequency of 60 Hz, and the light is Doppler shifted by Thomson scattering. Polychromators on the NSTX-U midplane collect the scattered photons at various radii/scattering angles, and the avalanche photodiode voltages are saved to an MDSplus tree for later analysis. IDL code is then used to determine plasma temperature, pressure, and density from the captured polychromator measurements via Selden formulas.[1] Previous work[2] converted the single-processor IDL code into Python code, and prepared a new architecture for multiprocessing MPTS in parallel. However, that work was not completed to the generation of output data and curve fits that match with the previous IDL. This project refactored the Python code into a object-oriented architecture, and created a software test suite for the new architecture which allowed identification of the code which generated the difference in output. Another effort currently underway is to display the Thomson data in an intuitive, interactive format.

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