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Modular Python-based Code for Thomson Scattering System on NSTX-U[1] BENJAMIN HOROWITZ, Yale University, AHMED DIALLO, ELIOT FEIBUSH, BENOIT LEBLANC, Princeton Plasma Physics Laboratory — Fast accurate and reliable measurements of electron temperature and density profiles within magnetically confined plasmas are essential for full operation of fusion devices. We detail the design and implementation of a modular Pythonbased code for the Thomson Scattering diagnostic system of NSTX-U which offers improvements in speed by making full use of the Python's architecture, open-source module packages, and ability to be parallelized across many processors. SciPy's weave package allows the implementation of C/C++ code within our program to clear up bottlenecks in data fitting while not loosing the flexibility and clarity of Python, while Numpy and MatplotLib allow calculations and plotting of the processed data. Using the standard MDSplus input, we create a flexible and expandable algorithm structure which can be implemented on any fusion device utilizing polychromator-based Thomson scattering diagnostic system.

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