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Recent Progress and Future Plans for Fusion Plasma Synthetic Diagnostics Platform[1] LEI SHI, GERRIT KRAMER, WILLIAM TANG, BENJAMIN TOBIAS, ERNEST VALEO, RANDY CHURCHILL, Princeton Plasma Phys Lab, LOIC HAUSAMMANN, Ecole Polytechnique Federal de Lausanne — The Fusion Plasma Synthetic Diagnostics Platform (FPSDP) is a Python package developed at the Princeton Plasma Physics Laboratory. It is dedicated to providing an integrated programmable environment for applying a modern ensemble of synthetic diagnostics to the experimental validation of fusion plasma simulation codes. The FPSDP will allow physicists to directly compare key laboratory measurements to simulation results. This enables deeper understanding of experimental data, more realistic validation of simulation codes, quantitative assessment of existing diagnostics, and new capabilities for the design and optimization of future diagnostics. The Fusion Plasma Synthetic Diagnostics Platform now has data interfaces for the GTS and XGC-1 global particle-in-cell simulation codes with synthetic diagnostic modules including: (i) 2D and 3D Reflectometry; (ii) Beam Emission Spectroscopy; and (iii) 1D Electron Cyclotron Emission. Results will be reported on the delivery of interfaces for the global electromagnetic PIC code GTC, the extended MHD M3D-C1 code, and the electromagnetic hybrid NOVAK eigenmode code. Progress toward development of a more comprehensive 2D Electron Cyclotron Emission module will also be discussed.

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