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Using the OMFIT framework to streamline HPC workflows[1]
STERLING SMITH, ORSO MENEGHINI, DAVID ELDON, JOSEPH MCCLENAGHAN, BRENDAN LYONS, MATTHIAS KNOLKER, KATHREEN THOME, General Atomics, BRIAN GRIERSON, NIK LOGAN, ARASH ASHOURVAN, QIMING HU, SHAUN HASKEY, PPPL, CHRISTOPHER HOLLAND, UCSD, THERESA WILKS, MIT, JM PARK, KYUNGJIN KIM, ORNL, VALERIE IZZO, Fiat Lux, CODY MOYNIHAN, U. Illinois, LEONARDO PIGATTO, Consorzio RFX, GREGORIO TREVISAN, ORAU, OMFIT TEAM — The OMFIT framework [http://gafusion.github.io/OMFIT-source] through its convenient GUIs and API has greatly streamlined the usage of high performance computing (HPC) in fusion research. Specifically, OMFIT has been used to conduct scans of physics and computation input parameters for a broad range of HPC simulations, including gyrokinetic, MHD, pedestal structure, and SOL applications. In many cases the results of these HPC simulations have been compiled in databases that have been used to generate machine-learning reduced models. Finally, the interface that the framework provides with experimental data is the ideal environment to carry out detailed validation studies of first-principles simulations and reduced models alike. As we bridge toward exascale computing, we expect OMFIT to continue to play a key role in making HPC applications accessible to the broader fusion community.

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