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Simulation Workflow for RF Fusion System Simulations[1] MARK SHEPHARD, MORTEZA HAKIMI, Rensselaer Polytechnic Institute, SYUNICHI SHIRAIWA, shiraiwa@psfc.mit.edu — Accurate RF simulations of fusion systems like ITER require the definition of high-fidelity analysis geometries that include antenna, reactor wall and physics region representations. This presentation will describe a workflow for the execution of adaptive high-performance FR fusion system simulations. The steps in the simulation workflow include; defeaturing of un-needed details from antenna CAD models; combining the antenna, reactor wall and physics components into a single analysis model geometry; applying physical attributes to the analysis model; automatically generating a graded mesh; and executing an adaptive finite element analysis that includes the application of a iterations of finite element solve, a posteriori error estimation, and mesh enrichment. To create this simulation workflow advanced geometry and meshing technologies from Simmetrix are combined with advanced RF simulation capabilities being developed by LLNL, PPPL and MIT.

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