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Theory Experiment

Developing Boundary/PMI Solutions for Next-Step Fusion Devices* H.Y. Guo, A.W. Leonard, D.M. Thomas, *GA*; S.L. Allen, D.N. Hill, *LLNL*; Z. Unterberg, *ORNL* — The path towards next-step fusion development requires increased emphasis on the boundary/plasma-material interface. The new DIII-D Boundary/Plasma-Material Interactions (PMI) Center has been established to address these critical issues on a timescale relevant to the design of FNSF, adopting the following transformational approaches: (1) Develop and test advanced divertor configurations on DIII-D compatible with core plasma high performance operational scenarios in FNSF; (2) Validate candidate reactor PFC materials at reactor-relevant temperatures in DIII-D high-performance plasmas, in collaboration with the broad material research/development community; (3) Integrate validated boundary-materials interface with high performance plasmas to provide viable boundary/PMI solutions for next-step fusion devices. This program leverages unique DIII-D capabilities, promotes synergistic programs within the broad PMI community, including linear material research facilities. It will also enable us to build a compelling bridge for the US research on long-pulse facilities.

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