

Abstract Submitted
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To Demonstrate an Integrated Solution for Plasma-Material Interfaces Compatible with an Optimized Core Plasma¹ ROBERT GOLDSTON, PPPL, JEFFREY BROOKS, Purdue, AMANDA HUBBARD, MIT, ANTHONY LEONARD, GA, BRUCE LIPSCHULTZ, MIT, RAJESH MAINGI, ORNL, MICHAEL ULRICKSON, SNL, DENNIS WHYTE, MIT — The plasma facing components in a Demo reactor will face much more extreme boundary plasma conditions and operating requirements than any present or planned experiment. These include 1) Power density a factor of four or more greater than in ITER, 2) Continuous operation resulting in annual energy and particle throughput 100-200 times larger than ITER, 3) Elevated surface operating temperature for efficient electricity production, 4) Tritium fuel cycle control for safety and breeding requirements, and 5) Steady state plasma confinement and control. Consistent with ReNeW Thrust 12, design options are being explored for a new moderate-scale facility to assess core-edge interaction issues and solutions. Key desired features include high power density, sufficient pulse length and duty cycle, elevated wall temperature, steady-state control of an optimized core plasma, and flexibility in changing boundary components as well as access for comprehensive measurements.

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Robert Goldston
Princeton Plasma Physics Laboratory

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