

Abstract Submitted
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ADX: a high field, high power density, Advanced Divertor test eXperiment¹ R. VIEIRA, B. LABOMBARD, E. MARMAR, J. IRBY, S. SHIRAIWA, J. TERRY, G. WALLACE, D.G. WHYTE, S. WOLFE, S. WUKITCH, MIT PSFC, FOR THE ADX TEAM — The MIT PSFC and collaborators are proposing an advanced divertor experiment (ADX) – a tokamak specifically designed to address critical gaps in the world fusion research program on the pathway to FNSF/DEMO. This high field (6.5 tesla, 1.5 MA), high power density (P/S \sim 1.5 MW/m²) facility would utilize Alcator magnet technology to test innovative divertor concepts for next-step DT fusion devices (FNSF, DEMO) at reactor-level boundary plasma pressures and parallel heat flux densities while producing high performance core plasma conditions. The experimental platform would also test advanced lower hybrid current drive (LHCD) and ion-cyclotron range of frequency (ICRF) actuators and wave physics at the plasma densities and magnetic field strengths of a DEMO, with the unique ability to deploy launcher structures both on the low-magnetic-field side and the high-field side – a location where energetic plasma-material interactions can be controlled and wave physics is most favorable for efficient current drive, heating and flow drive. This innovative experiment would perform plasma science and technology R&D necessary to inform the conceptual development and accelerate the readiness-for-deployment of FNSF/DEMO – in a timely manner, on a cost-effective research platform.

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