

Abstract Submitted
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DIII-D to Meet the Challenge of Fusion Energy¹ RICHARD BUTTERY, General Atomics - San Diego, FOR THE DIII-D TEAM — DIII-D seeks to discover the new science and solutions for fusion energy – to make the plasma burn in ITER and pioneer the path to a fusion pilot. Through a combination of new techniques and performance upgrades, it is possible to transform its capabilities, accessing reactor-like high power and particle densities to develop high energy confinement solutions, crucial for a compact pilot, compatible with a dissipative divertor. Upgrades are already underway to explore this exciting territory. Doubling off-axis beam injection broadened profiles to raise stability and prevent energetic particle modes. Top launch EC injection doubled current drive efficiency – 2 more are planned. New helicon fast wave and inboard-launch LHCD are being installed to pioneer efficient reactor current drive technology. Projections indicate higher field and shaping will reach high, opaque, reactor-like pedestals, combining with new slot divertors, observed to lower target temperatures, and reactor-relevant materials tests to explore integrated core-edge solutions. An exciting negative triangularity path will also be assessed. These combine with new 3D flexibility and particle injectors to eliminate the disruption problem, enabling DIII-D to confront the challenges of the next generation of fusion reactors.

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