

Abstract Submitted
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Progress toward fully non-inductive operation in NSTX
JONATHAN MENARD, PPPL, NSTX RESEARCH TEAM — Several machine and operational upgrades have been implemented on NSTX to improve MHD stability limits and increase pulse duration. H-modes induced during the plasma current ramp increase the central safety factor and decrease the internal inductance l_i . Reduced l_i allows stable operation with high elongation which can increase the poloidal beta and bootstrap fraction. Newly installed divertor coils now allow for high triangularity > 0.7 to be achieved at high elongation > 2.5 , and this enhanced plasma shaping allows operation with small ELMs at high elongation. The combination of these improvements has resulted in record discharge pulse-lengths > 1.5 s in NSTX with normalized beta above 4 sustained for over 1s. In these scenarios, the peak non-inductive current fraction exceeds 70% with 60% of the current driven by the plasma pressure gradient. MHD stability, transport, and current profile evolution characteristics of these long-pulse plasmas will be described.

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