Abstract Submitted
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Transport properties of NSTX-U L- and H-mode plasmas[1] STANLEY KAYE, WALTER GUTTENFELDER, RON BELL, AHMED DIALLO, BEN LEBLANC, MARIO PODESTA, Princeton Plasma Physics Laboratory, Princeton University, Princeton NJ 08543 — The confinement and transport properties of L- and H-mode plasmas in NSTX-U has been studied using the TRANSP code. A dedicated series of L-mode discharges was obtained to study the dependence of confinement and transport on power level and beam aiming angle. The latter is made possible by having two beamlines with 3 sources each, capable of injecting with tangency radii from R_{tan} =50 to 130 cm (R_{geo} =92 cm). L-mode plasmas typically have confinement enhancement factors with H98y,2=0.6 to 0.65, exhibiting a 25% decrease in confinement time as the beam power is raised from 1 to 3 MW. Associated with this is an increase in the electron thermal diffusivity in the core of the plasma from 3.5 to 10 m^2/s. Electron thermal transport is the dominant energy loss channel in these plasmas. H-mode plasmas exhibit improved confinement, with H98y,2=1 or above, and core electron thermal diffusivity values <1 m^2/s. Details of these studies will be presented, along with the results of the beam tangency radius scan in L-mode plasmas.

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