Abstract Submitted
for the DPP11 Meeting of
The American Physical Society

Overview of Recent Results from the National Spherical Torus Experiment* S.A. SABBAGH, Columbia University, FOR THE NSTX TEAM — Both spherical torus devices for fusion development and ITER require high energy confinement, sustained stability, and manageable first wall heat fluxes. NSTX research targets a predictive understanding of these needs. Low-k microtearing simulations predict lower collisionality, ν, to be nonlinearly stabilizing. Measured ion gyro-scale fluctuations transiently decrease after the H-mode transition, while high-k scattering shows electron gyro-scale fluctuations may increase at lower ν. Other channels for transport such as high frequency Alfvenic modes are examined. Increased RWM stability is expected at lower ν only if stabilizing precession drift/bounce resonance conditions are maintained. Improved RWM control now includes radial and poloidal field sensors, and state space feedback with a 3D conducting structure model. Non-inductive current fractions of 65-70% have been sustained. Divertor heat flux width strongly decreases as I_p increases but snowflake divertor studies have reduced the heat flux significantly. Beneficial effects due to lithium depend nearly continuously on the amount of pre-discharge Li evaporation. Mo divertor tiles have been installed to determine the impact of Li-coated metallic PFCs at strike point locations. Coaxial helicity injection has produced 0.37MA peak current and yielded a 40% inductive flux savings for ohmic startup to 1MA plasma current. *Work supported by U.S. DOE contract DE-AC02-09CH11466.

S.A. Sabbagh
Columbia U.

Date submitted: 19 Jul 2011 Electronic form version 1.4