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NSTX Research, Recent Results, and Advancing Plasma Science Through Complementarity with Other U.S. Program Elements E.J. SYNAKOWSKI, Princeton Plasma Physics Laboratory, NSTX RESEARCH TEAM — Presented here are highlights from 2005's research effort. Emphasis is placed on complementarity between NSTX and moderate aspect ratio devices that makes for a scientifically powerful whole and advances fusion science generally. This year, advantage was taken of increased shaping, control, and wall preparation capability that enables connection with and extension beyond the moderate aspect ratio database in key parameters such as plasma beta and shaping factors. The 2005 NSTX research approach was broad, with advances made in understanding of MHD and mode control, transport and turbulence, wave and wave-particle physics, fast-ion MHD, solenoid-free startup and sustainment, and boundary physics. Integration of key elements of each topic enabled advances towards a long-term goal of high beta, solenoid-free sustained operations. A description of progress and issues on each of these topics, especially as they take advantage of key similarities and differences with other elements within the U.S. and world programs, will be outlined.

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