RF Loading Measurements of the HHFW Antenna Array from the NSTX Plasma*

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The next phase of NSTX operation is scheduled to start in August and initial rf experiments will concentrate on the measurement of the electrical load presented by the plasma to the 30 MHz, 12-strap, high harmonic fast wave (HHFW) antenna array. This is the first step in characterizing the rf system performance, in testing and, if necessary, modifying the theoretical power coupling predictions, and in developing operating techniques and control methods for the eventual achievement of multi-megawatt power levels. The antenna array will be excited by low level (< 1 watt) signals and the resultant plasma load will be measured as a function of array phasing, plasma density, plasma current, and antenna-to-plasma surface spacing and further correlated with information from available diagnostics. Comparisons will be made with the RANT3D plasma coupling calculations.
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