Lower Hybrid wave absorption on the MST

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Motivation

Experimental Setup

Near Field Interaction

Modelling

X-ray observations

Future Direction

High field cutoff

Low field cutoff

Target Probe reveals small population of runaway electrons just inside the vacuum vessel, however our absorption profile is dependent on outboard side and decreases on inboard side of the antenna.

Increased x-ray flux makes detection of fast-slow mode transference easy.

RF Turnoff

Flux [counts/cm²/sr/s/keV]

Counts

X-ray emission jumps up immediately following RF turnoff.

More data needed to lower dispersion in ray calculations.

Model (<38 keV)

X-ray observation reveals left handed circular polarization of the wave.

High LH power anticipated due to antenna repairs.

Model (<38 keV)

X-ray observations show that the dispersion of counter launched LHCW waves is quite low and only limited n|| absorption occurred.

Models suggest upper hybrid frequency is the critical frequency for mode coupling. Antenna has a limited effect on the spectrum.

X-ray observations reveal increased x-ray flux and improved confinement modes (~1 ms) and high temperature (~1.0 keV).

Target Probe reveals small population of fast electrons with energies above 16-20 keV Maxwellian at the edge of the vacuum vessel, however our absorption profile is dependent on outboard side and decreases on inboard side of the antenna.

X-ray observation reveals a fast drop off of emission.

Antenna Location

Flux [counts/cm²/sr/s/keV]

Energy [keV]

Counts

Time traces of x-ray emission reveal fast drop off of emission.

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