Recent results and proposed upgrade for CSM thin foil detector on NSTX

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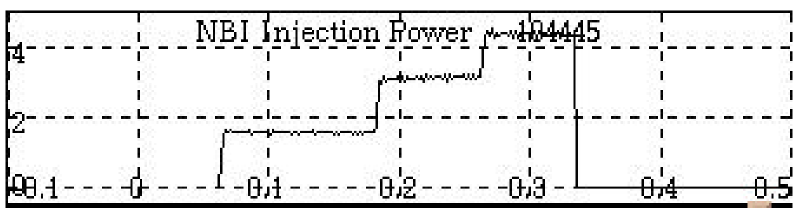
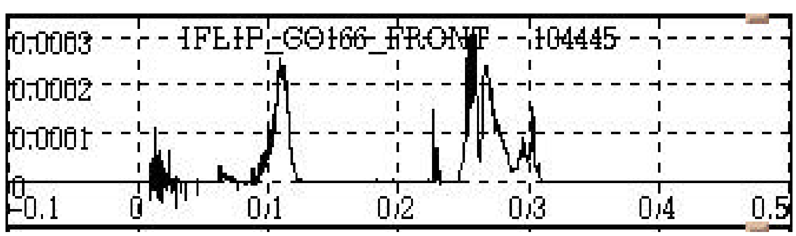
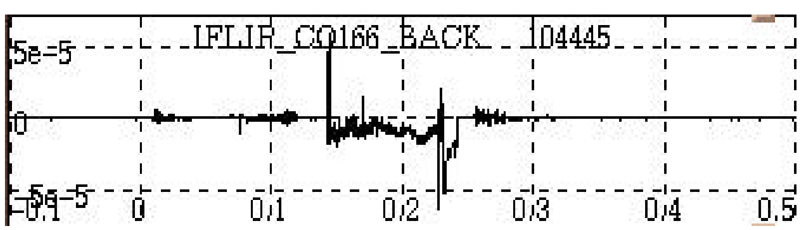
2 foil (19mm x 19mm x 2.5 μm Ni separated by μm mica) Faraday current detector installed NSTX as part of fast ion loss probe.

Observed current densities up to about 60 μA/c during NBI shots.

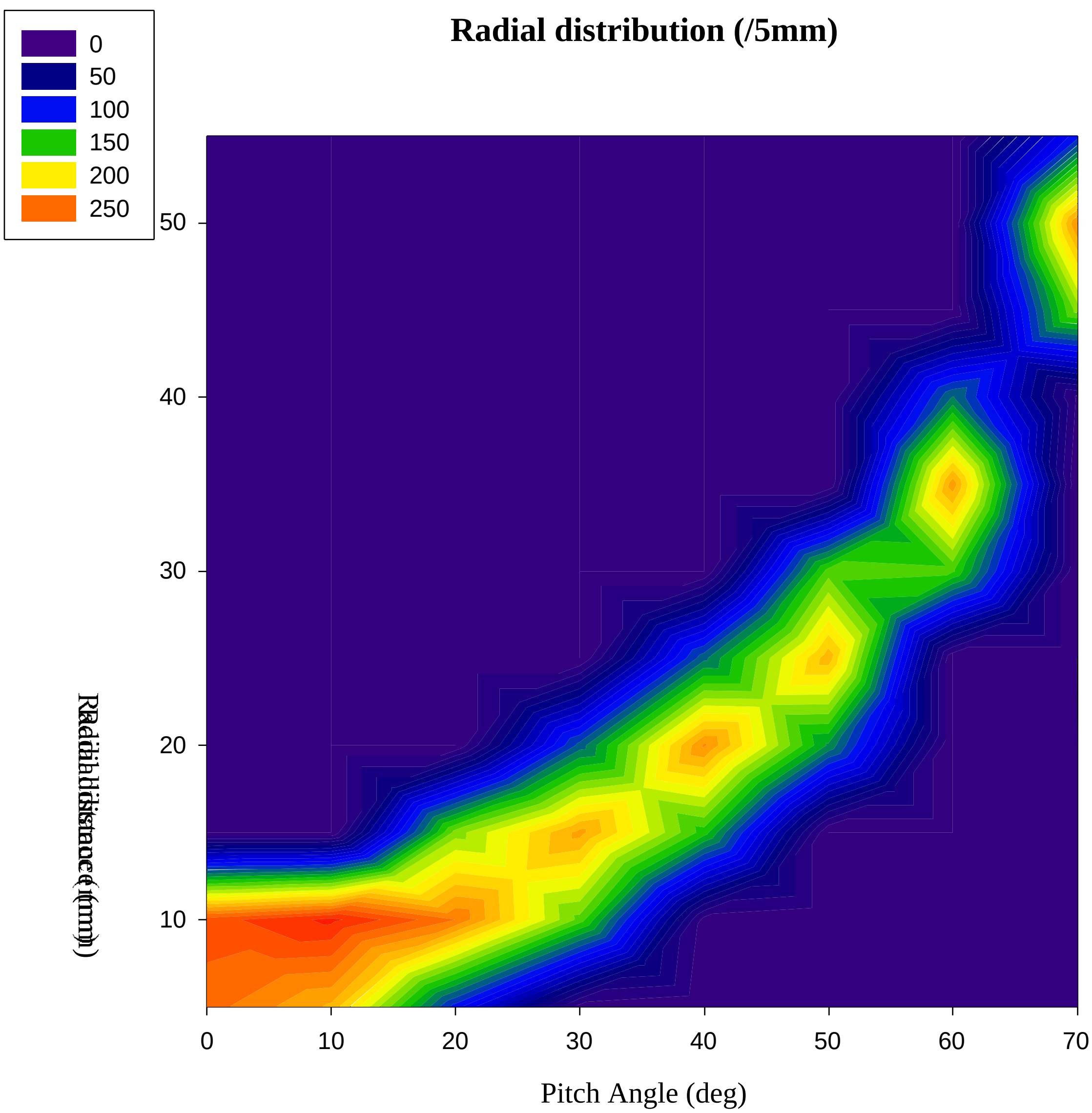






Proposed upgrades (1)

Series of side-by-side thin foil detectors opposite to a single aperture to investigate pitch angle distribution of lost ions. A MONTE-CARLO calculation shows the distribution of 80 keV lost protons on a plane 20 mm from a 3 mm diameter aperature in a 1.0 T magnetic field which is perpendicular to the detector plane



Proposed upgrades (2)

3-foil detector consisting of:

1. very thin front foil: 0.1 μm of deposited gold
2. very thin insulating layer: 0.05 μm deposited Alumina
3. relatively thick conducting layer: 2.5 μm Ni
4. relatively thick insulating layer: 2.5 μm mica
5. relatively thick back control conducting layer : 2.5 μm Ni

This detector will resolve energy of lost with 20 ≤ E ≤ 120 keV by measuring the current in the second foil (F.E. Cecil, et al., RSI. **72** 792 (2001)). Example: