

Update on calculations for thicker NSTX Upgrade passive plates

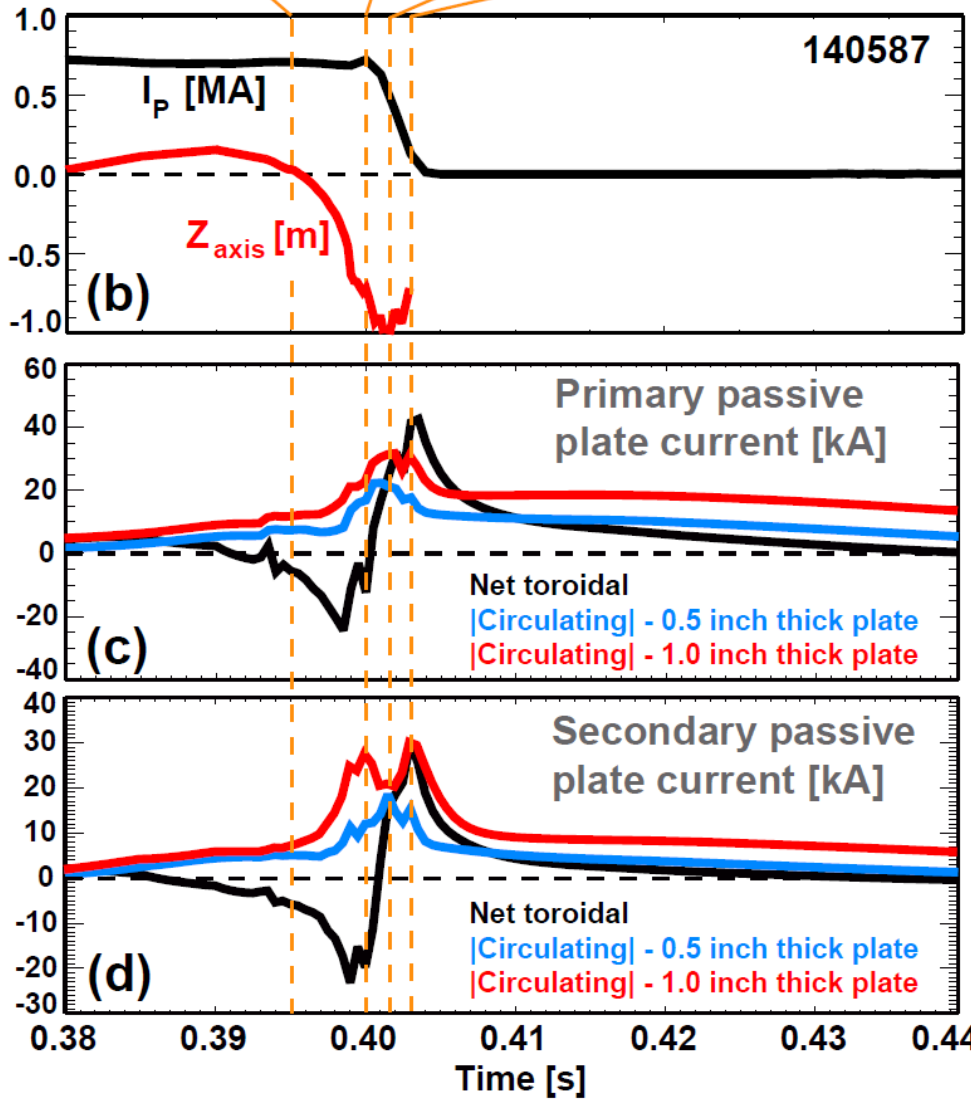
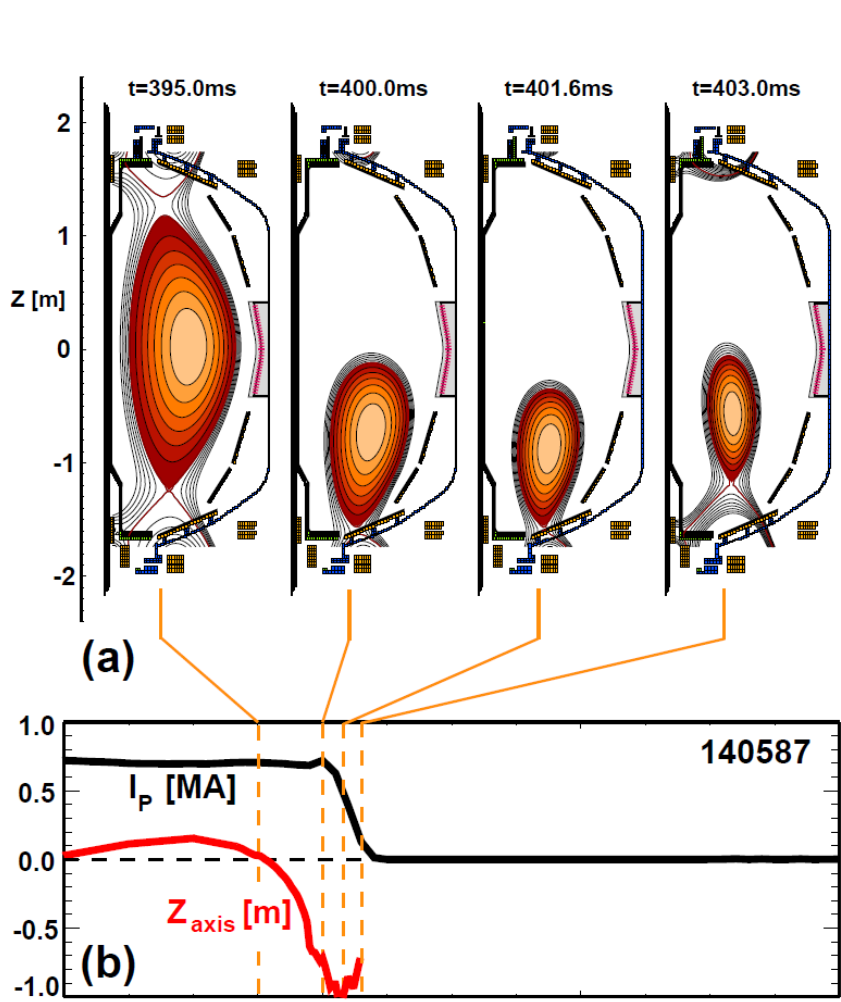
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Changes since previous analysis

- Increased radial resolution of plate
 - Capture changes in current density from front to back of plate
- Increased time resolution of disruption evolution
 - Better capture peak current values
- Include tests of 1" thick passive plates
 - Net toroidal current unchanged
 - 50-70% increase in maximum circulating current
 - Maximum current density decreases somewhat → force density is lower, but total force is higher

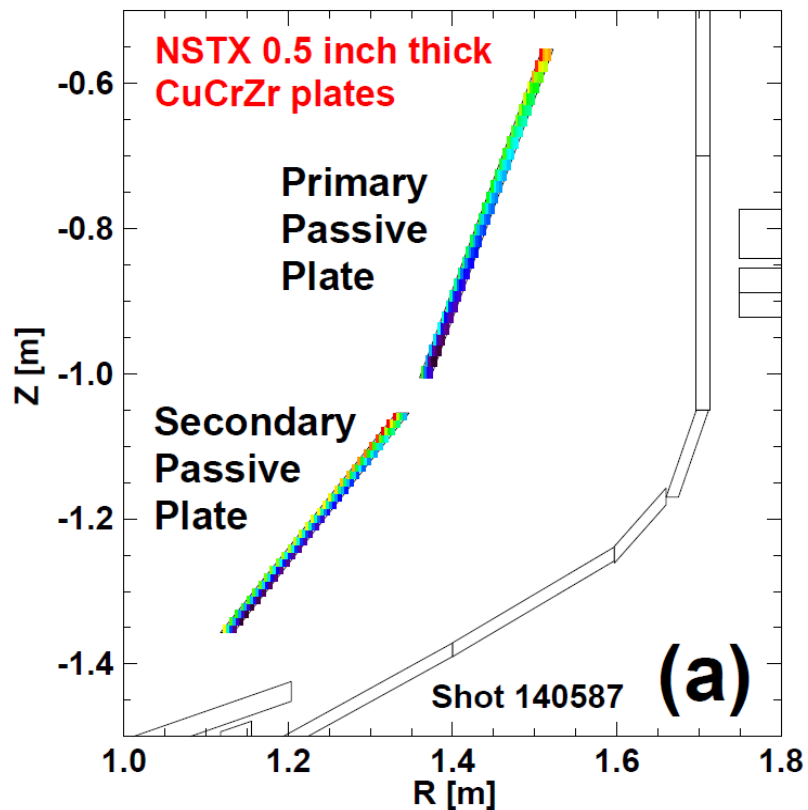
Net toroidal and circulating currents for 0.5", 1" plates



Maximum circulating current of 1" plates is $\sim 1.5x$ that of 0.5" plate (i.e. $< 2x$)

Toroidal current densities for 0.5", 1" plates

Region current density J_ϕ (R,Z) at t=403.0 ms

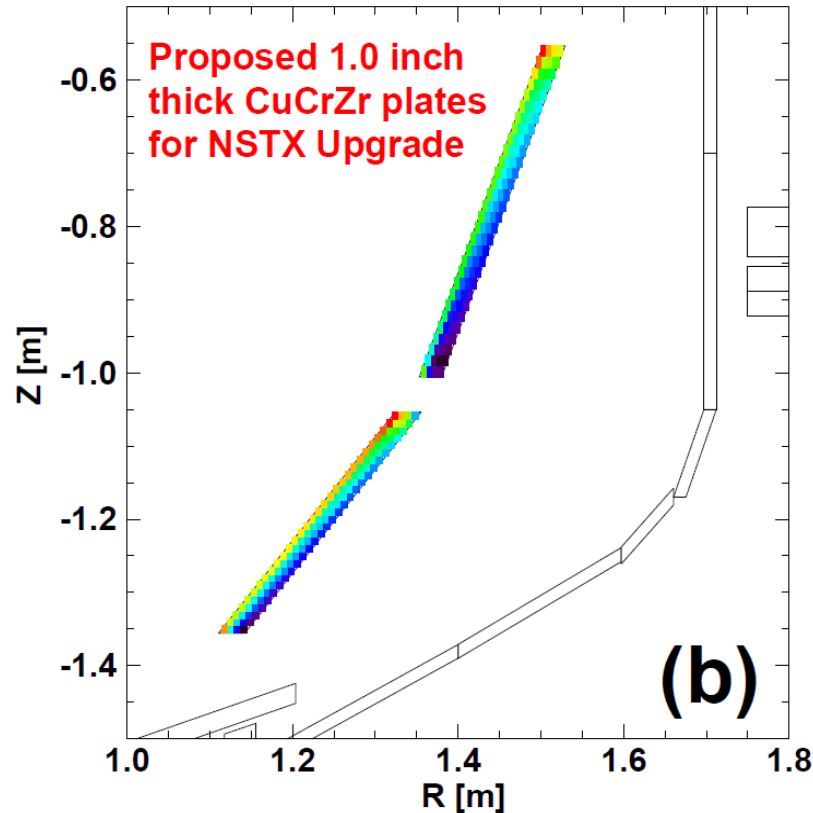


Primary net toroidal current = 41.5kA, circulating current = 17.7kA

$-6.27 \times 10^6 \text{ A/m}^2$ 0 $2.72 \times 10^7 \text{ A/m}^2$

Secondary net toroidal current = 30.2kA, circulating current = 15.3kA

$-6.77 \times 10^6 \text{ A/m}^2$ 0 $2.43 \times 10^7 \text{ A/m}^2$



Primary net toroidal current = 42.6kA, circulating current = 30.2kA

$-7.84 \times 10^6 \text{ A/m}^2$ 0 $2.12 \times 10^7 \text{ A/m}^2$

Secondary net toroidal current = 29.9kA, circulating current = 29.9kA

$-1.22 \times 10^7 \text{ A/m}^2$ 0 $2.08 \times 10^7 \text{ A/m}^2$

Maximum current density for 1" plates is 75-85% that of 0.5" plate