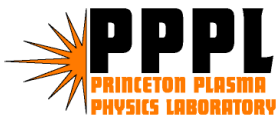


# Prompt $\alpha$ loss modeling for ITER detectors

D. Darrow, R. Budny, R. Feder, G.

D. Loesser

PPPL



D. Darrow  
ITPA Diag Mtg March 27, 2007

# Is wall of NBI duct suitable location for lost $\alpha$ detectors?

- Toroidal symmetry of ITER first wall and desire not to have objects project toward plasma from wall left side wall of NBI duct as most obvious possible location for lost  $\alpha$  detector
- Evaluated this location using full gyro-orbit following code and simplified model of ITER wall & duct
- Used 2 magnetic equilibria: H-mode & hybrid mode & calculated  $\alpha$  flux to detector

# No $\alpha$ flux found to detector in NBI port

- No flux found for either equilibrium tried, even with detector displaced radially 1 cm inward toward plasma
- Even very rapid radial transport unlikely to produce signal at this location
- Need:
  1. Diagnostics allowed to protrude from wall, or
  2. New detection technology when  $\alpha$ s strike wall, or
  3. Rely on IR imaging of first wall