# Prompt $\alpha$ loss modeling for ITER detectors

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

PPPL

# 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