Energetic Particle-driven GAM in NSTX
G.Y. Fu

- Validation of energetic particle simulation model (wave particle resonances, nonlinear dynamics, source/sink effects)

- Finite beta and low aspect ration effects on EGAM (i.e., NSTX v.s. DIII-D);

- Effects of EGAM on background turbulence?

The goal of this XP is to excite EGAM in NSTX using conditions similar to DIII-D's

- $q_{min} > 3$, Te~Ti~1kev, B~0.5T, ne~ 10^{13}/cm^3, $E_{beam} < 70$kev.
- Counter-injection;
- Pre-heat using HHFW to increase plasma temperature so that T~1kev at the start of NBI injection and $q_{min} > 3$.

Counter-injection is required

- DIII-D results showed counter-injection is necessary for EGAM excitation;
- Recent theory (Berk et al.) explained this observation: finite orbit width effects induce an additional drive/ damping for counter/co injection;
- The length of counter-NBI should be short due to large prompt loss.
- Estimated run time: one day.

- Required diagnostics:
– BES, upgraded 16-channel reflectometer
– All fast ion diagnostics (FIDA, NPA, ssNPA, sFLIP)
– Plasma profiles (MPTS, CHERS, MSE) & magnetics