

# Resistive Wall Mode Stability Forecasting in NSTX and NSTX-U

- A comprehensive approach to prevention of disruptions through forecasting and avoidance is needed for future devices
- Unstable RWM detection based on a  $B_p$  signal is useful for characterizing the timing of the RWM and its place in the disruption event chain, but can potentially come too late to take corrective action
- Reduced kinetic model for warning of approaching marginal stability
  - Ideal terms from parameterized model (including  $\beta_N$ ,  $I_i$ ,  $p_p$ , and  $A$ ) successfully predict no-wall limit for NSTX and NSTX-U
  - Kinetic model, based on full MISK physics insight and including rotational resonances with precession and bounce frequencies as well as collisionality and EP effects, is presently being theoretically developed and implemented in DECAF
- Work to be done / data to be obtained:
  - Continued development of DECAF (Berkery, Sabbagh, Y. Park, summer student)
  - Use of real-time CHERS (velocity, ion density and temperature) in kinetic RWM model in high beta plasmas (Podesta, Bell)
  - XP-1546: RWM Stabilization... (Berkery)