

# Preparations for 2009 Energetic Particle Physics Campaign

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# Diagnostic capabilities (more details in coming talks)

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- Reflectometers
  - 70 GHz channel for H-modes?
- FReTIP
  - Upgrade to higher bandwidth? Useful in H-modes.
- BES
  - Possibility of some data, but unlikely?
- Soft x-rays: same  $\approx 100$  kHz bandwidth
- FIDA: same filter-FIDA and spectrometer-FIDA
- sFLIP
  - faster camera?
- NPAs; same scanning and “solid state” systems
- Neutrons
  - Bigger (faster) scintillator?

# Many Topics for EP Research

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- TAE Avalanches (known redistribution or loss)
- EPM Avalanches (known redistribution or loss)
- BAAE documentation
- TAE aspect ratio scaling (DIII-D joint XP)
- Three-wave coupling (EPM/TAE/GAE/CAE)
- Energetic particle driven GAMs
- CAE/GAE Avalanches
- Alfvén Cascades
- RF suppression of TAE or GAE Hole-Clumps
- Ripple & Error field induced losses
- Electron transport w/GAE&CAE (T&T group)

# TAE Avalanches in H-mode

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- Develop TAE Avalanching H-mode target plasmas:
  - Avalanches occasionally seen in H-modes.
  - Need to develop a target plasma with possibly slightly peaked, moderate density.
  - Identify conditions under which avalanches are seen; scaling with density, beam power, field, current, etc.
- Begin initial experiments, even with limited diagnostics
  - Possibly 70 GHz reflectometer
  - FIReTIP
  - Soft x-ray cameras
  - Fast ion diagnostics

# Possible TAE avalanches are also seen on DIII-D

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- Plan would be to reproduce these conditions.
- New diagnostics would greatly improve comparisons with theory.
- MSE measurements of current profile may be an issue.
- Also, no ECE data on mode structure

