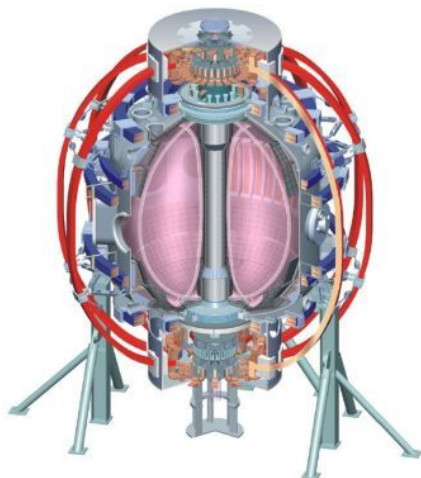


Summaries of XPs 1027 and 1064

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**NSTX Monday Physics Meeting
June 7, 2010**

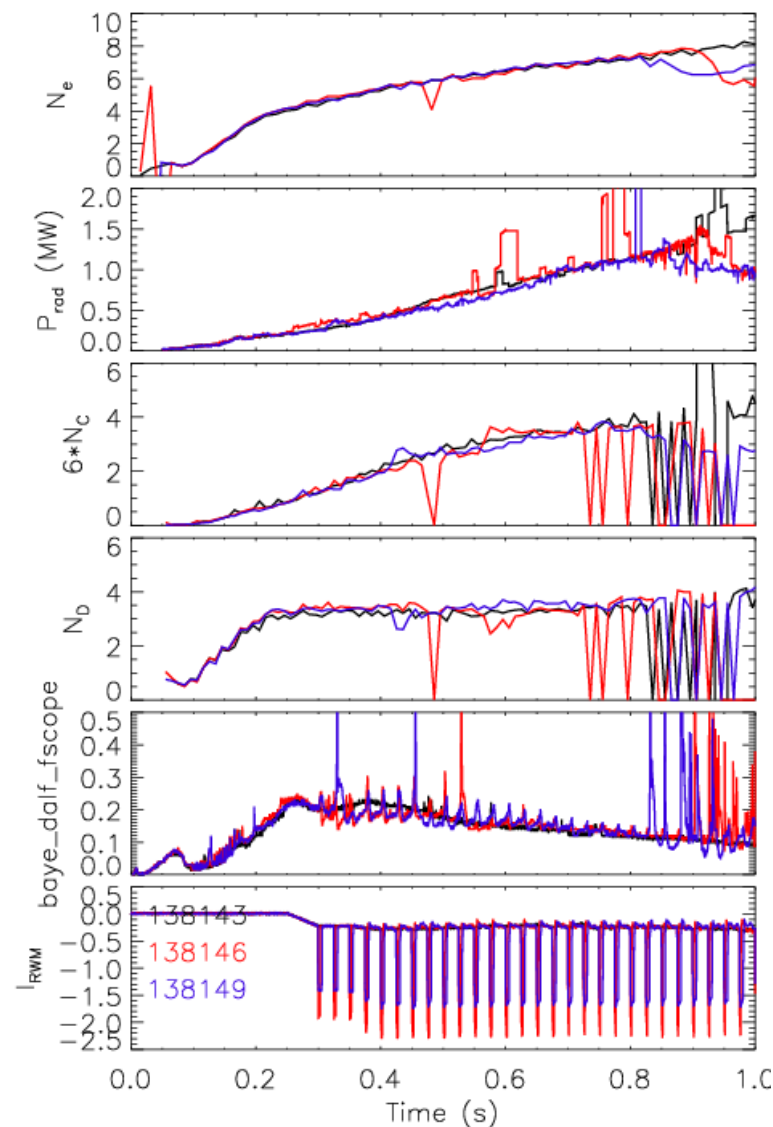


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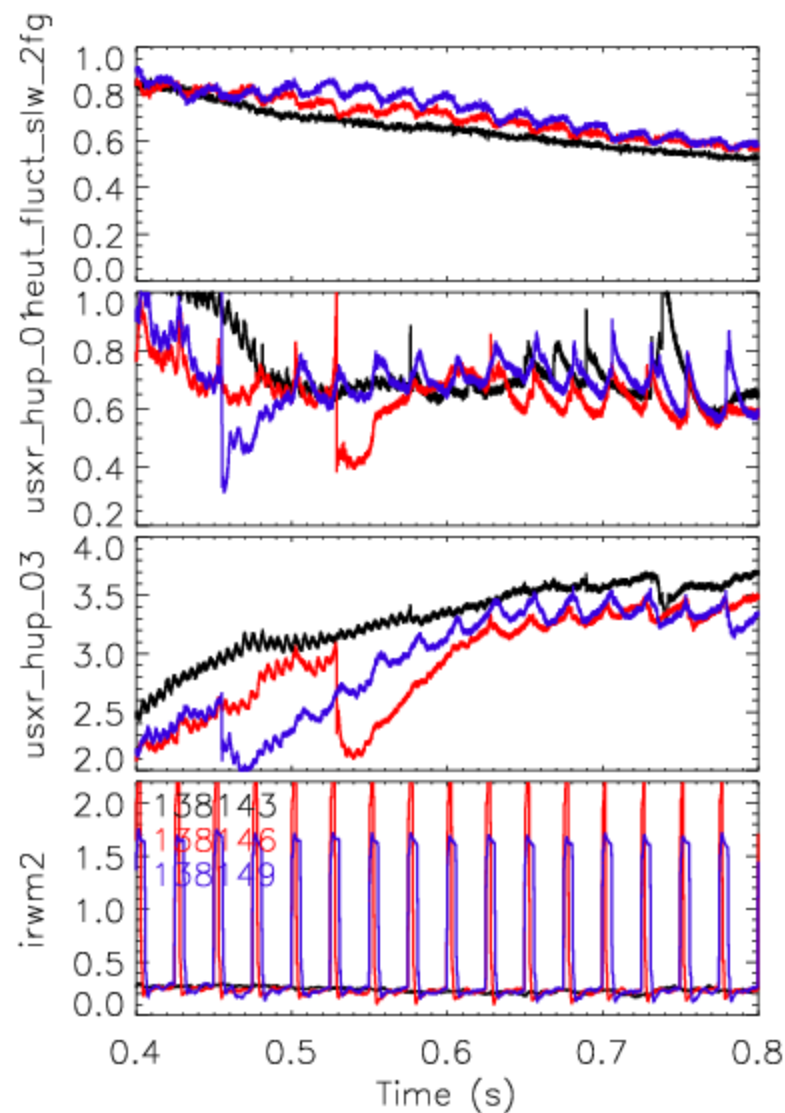
XP1027: RMPs below ELM-triggering threshold for impurity screening

- Goal of XP: test if particle transport can be increased via RMPs, without triggering ELMs
 - Used $n=3$ pulses too short/small for ELM-triggering
 - Impurity expulsion-ELMs=good
- Successfully produced “blurps” on D_α , without large ELMs
 - Trains of ELMlets produced for two values of SPA current and pulse width
 - No dramatic impact on P_{rad} or carbon inventory evolution



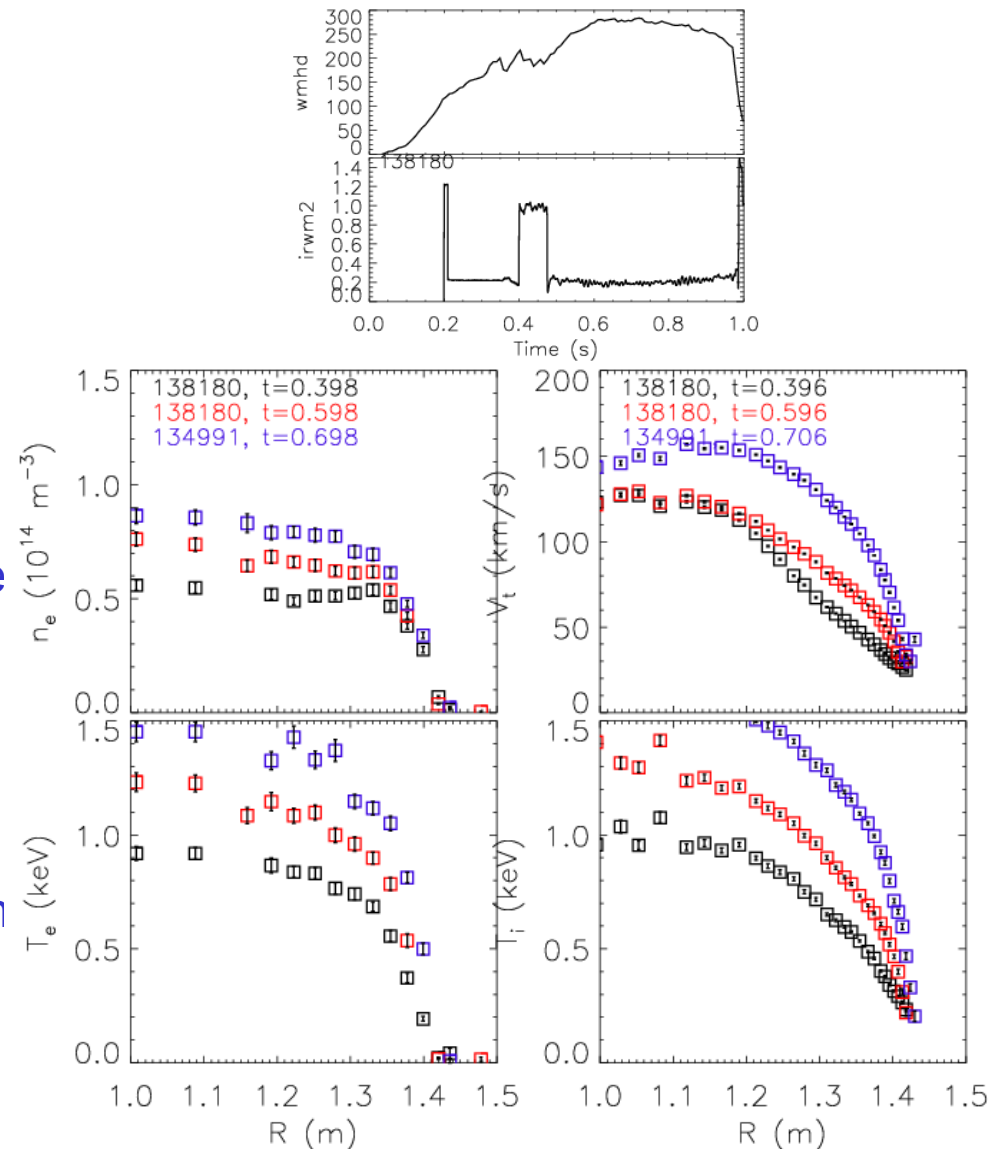
A lot of data was gathered on response to $n=3$ pulses

- ELMlets visible on several fast cameras
- Neutron rate modulated by pulses
 - Also modulation in GAE amplitude \rightarrow changes to fast ion distribution?
- Modulation also seen on USXR array (hup with 5 μm filter)
 - During $n=3$ pulse, edge channel increases (hup01),
 - More core channel (hup03) often decreases



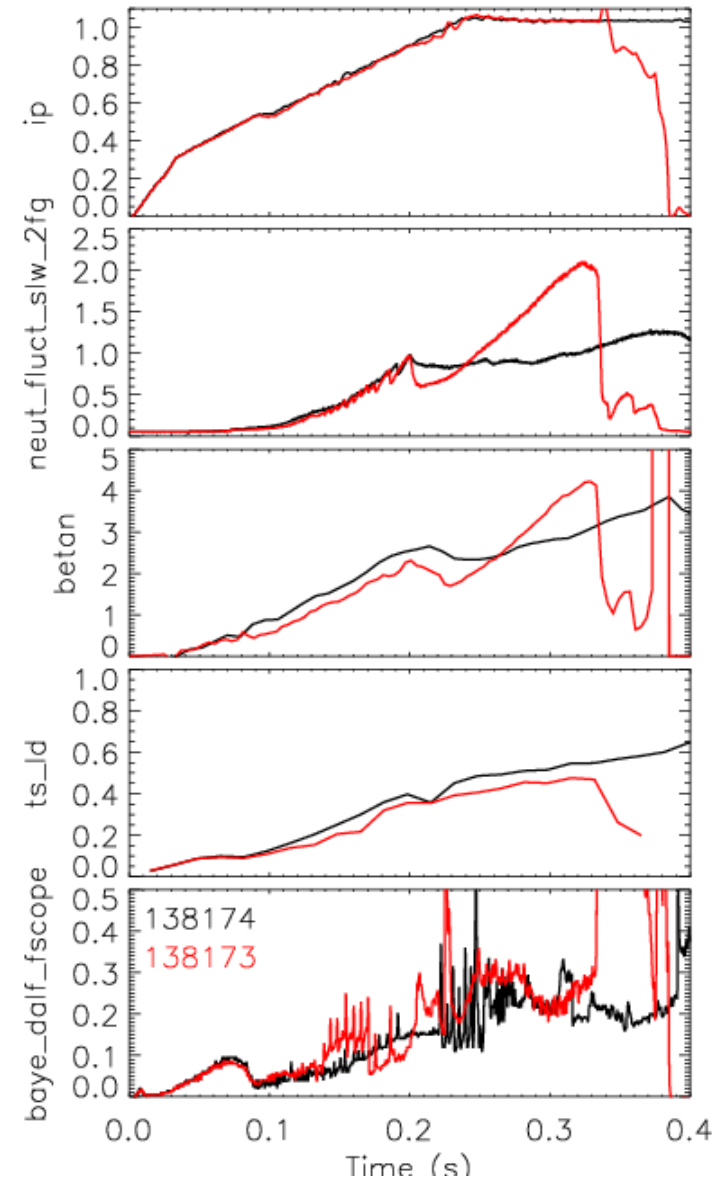
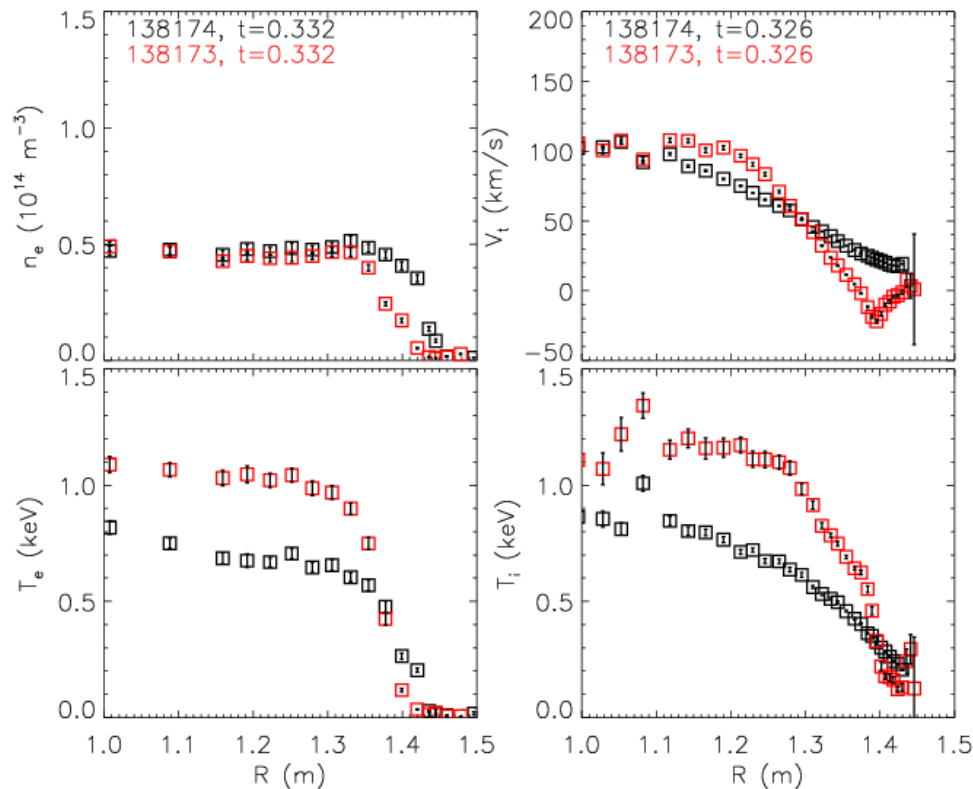
XP1064: Development of EPH long-pulse mode

- Goal: test if EPH can be reliably triggered
 - Main tool is $n=3$ pulses
 - Several other knobs thought to possibly be conducive to EPH
 - Secondary goal to extend EPH phase using e.g. beta feedback
- Periods of improved confinement following $n=3$ pulses observed during flattop, but not EPH proper
 - Raising I_p , lithium brought out some traits of EPH during this phase
 - Increased edge V_t shear
 - Higher T_e, T_i pedestals
 - But not the dramatic change seen previously in EPH (134991)
 - High confinement phases also seen during control shot next morning, following large MHD events



EPH produced early in discharge using SGI

- CS puff reduced (1200 to 1000), replaced with SGI (138173)
- Transitions to EPH around $t \sim 0.23$ s
 - Fast ramp in neutron rate, β_N
 - Lasts to $t \sim 0.33$, then disruption



Spent ~10 shots trying to extend SGI-enabled early EPH

- EPH seen in ~4-5 shots
- Pre-programmed reduction in P_{NBI} achieved during one of these
 - Still disrupted early, at lower β_N
- Efforts to extend EPH phase largely unsuccessful
 - Tried increasing Li, tweaking I_p (1.0- \rightarrow 0.95 MA) and B_t (.45- \rightarrow .48 T)
 - Last shot (.95MA/.48T) ran through, but no EPH

