

XP840

**Study of the correlation between
GAE activity and electron transport**

D. Stutman, L. Delgado, K. Tritz, M. Finkenthal

Johns Hopkins University

N. Gorelenkov, E. Fredrickson, S. Kaye, E. Mazzucato

Princeton University

Goals

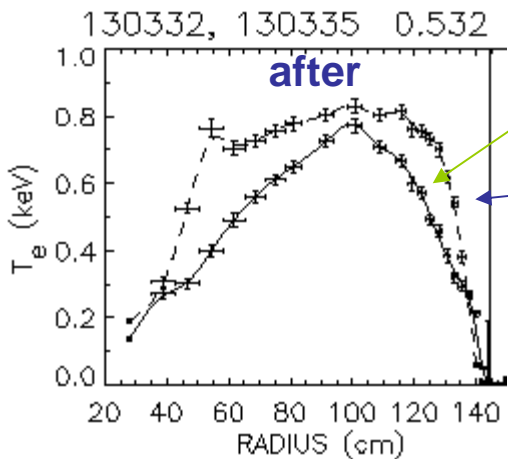
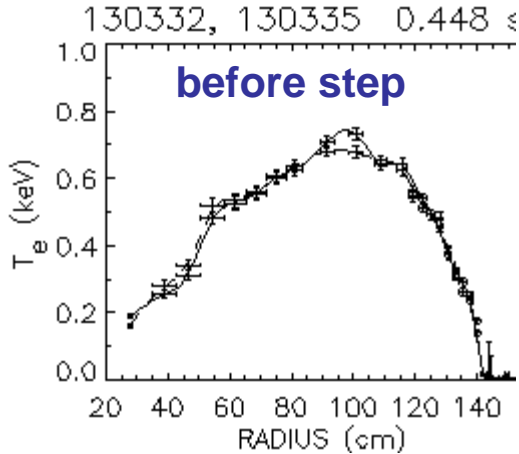
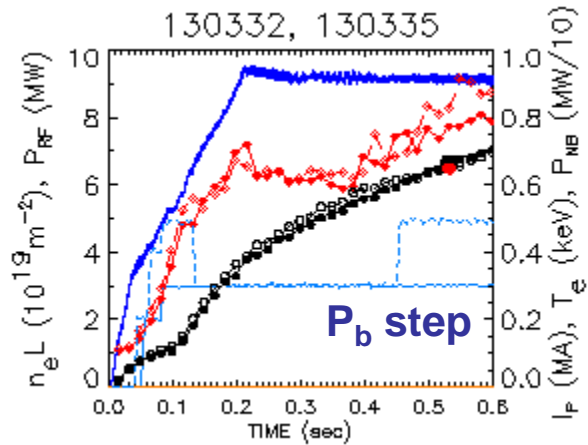
- Compare T_e in plasmas with/without GAEs (few scenarios)
- Same q , n_e as much as possible
- Document with high- k (GAEs, turbulence), neon injection

- **Scenario I: P_b step at fixed- q and increasing V_b (two fields)**
 - good results at 4.5 kG: T_e flattening correlates with GAE increase
 - good GAE data with high- k interferometry; not much scattering (ETGs)
 - good data also at 5.5 kG, but H-mode late (q changed)
 - neon injection collapsed discharge (post-Li?); high n_e , metals

- **Scenario II: Compare plasmas with same P_b but different V_b**
 - achieved low V_b /high V_b 4 MW H-modes
 - not striking difference in GAE activity
 - possibly better electron transport with less GAEs

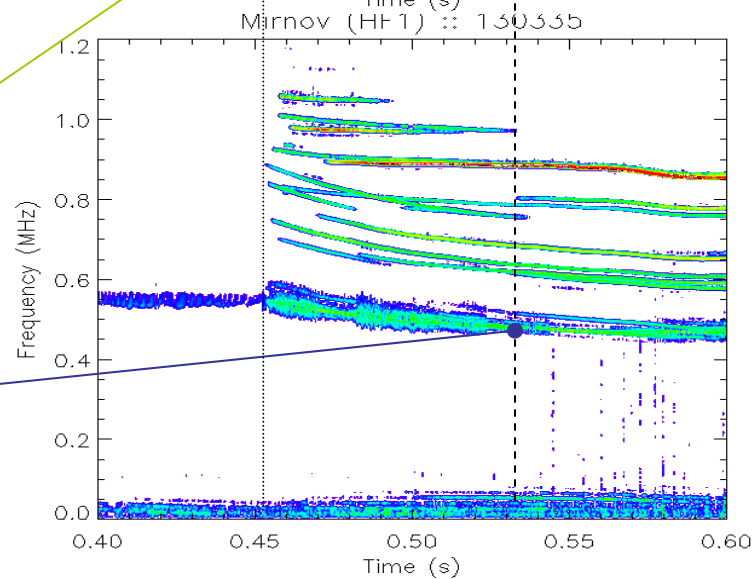
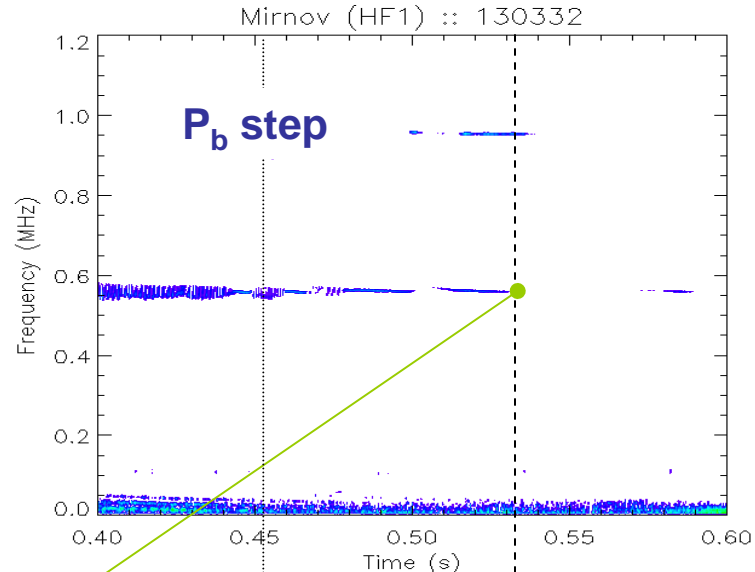
- **Scenario III: Compare RF heating in NB deuterium plasma with/w.o. GAEs**

Extremes of P_b step at increasing V_b



A/90
C/65
3 MW

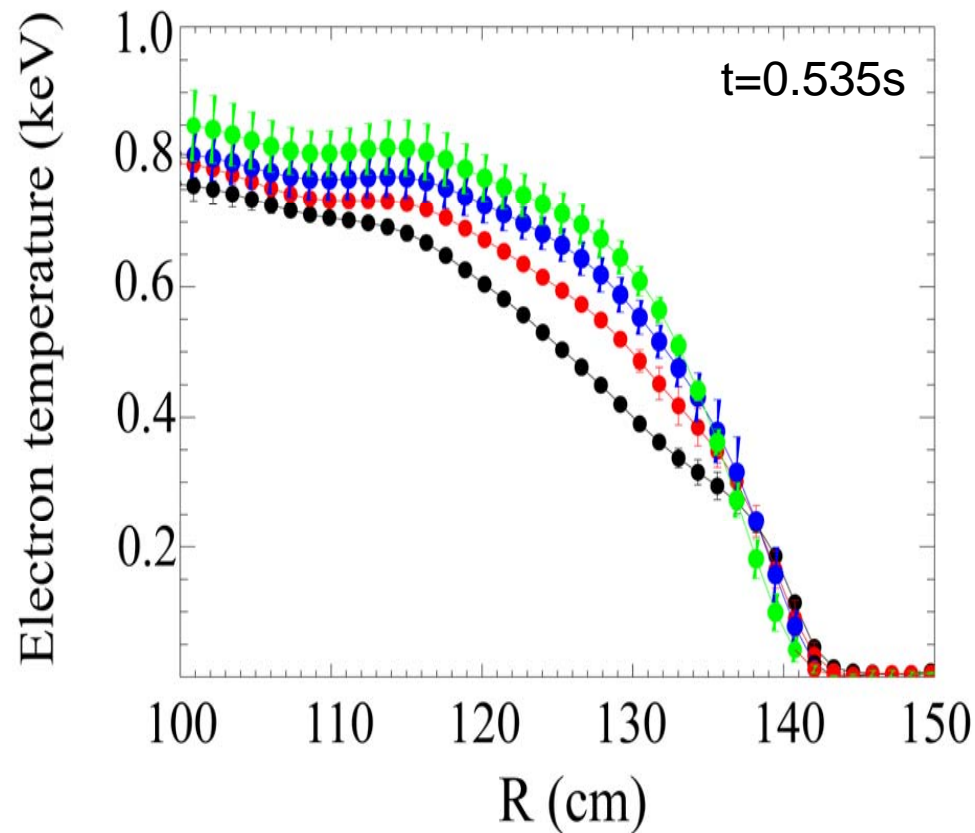
A/90
C/65
B/90
5 MW



- Flatter T_e correlates with stronger GAEs

V_b scan confirms progressive flattening

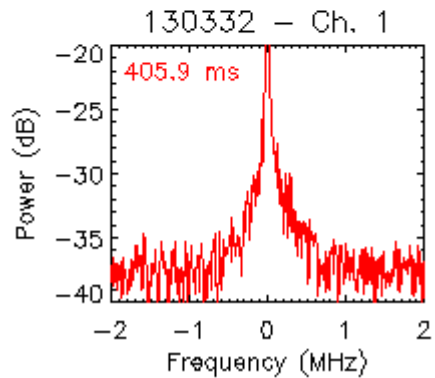
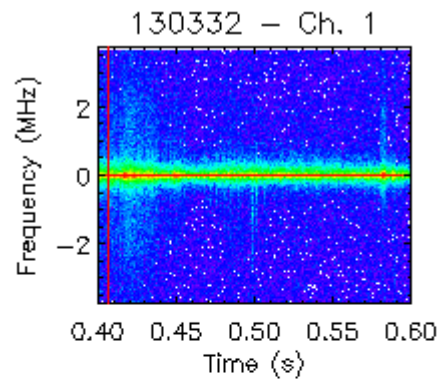
V_b / P_b	0/3	60/3.8	80/4.7	90/5.1
	130332	130341	130339	130335



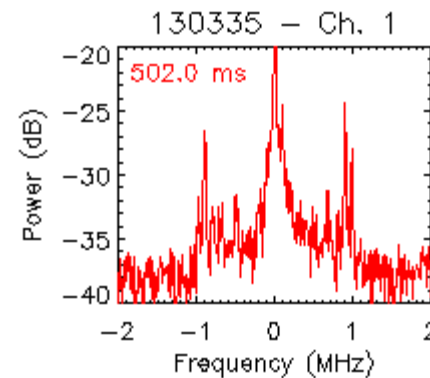
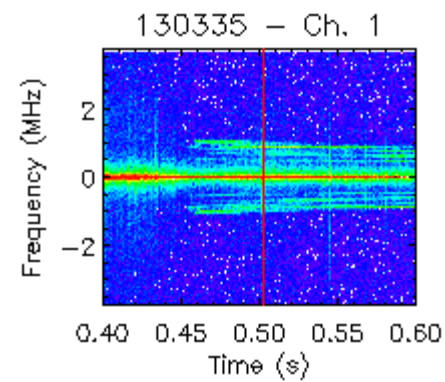
T_e averaged
between
 $t=0.51-0.54$ s

High-k interferometric data for GAE amplitude

A/90
C/65
3 MW

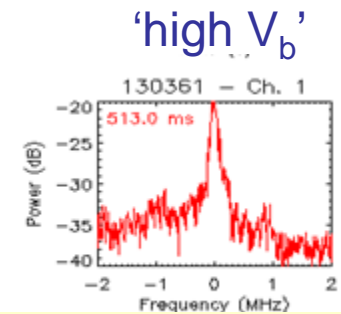
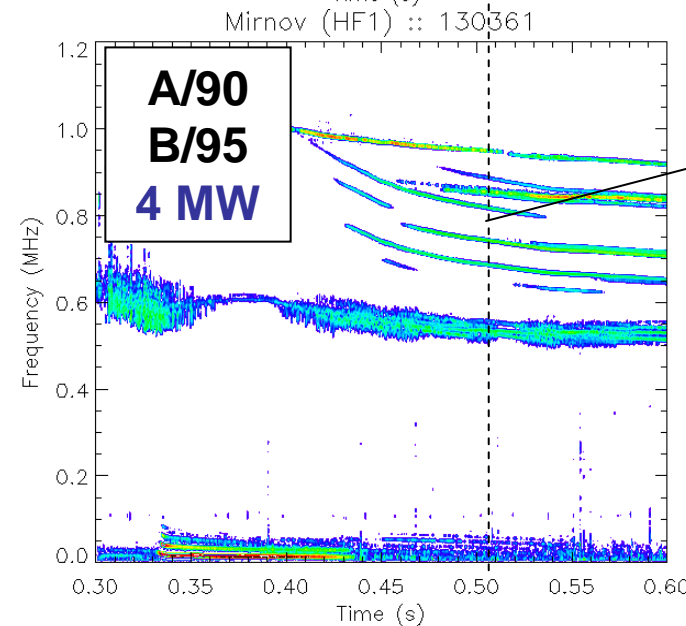
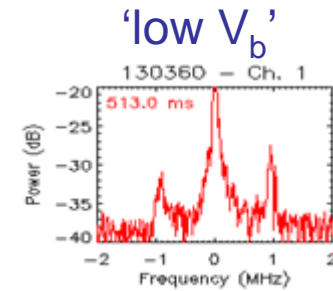
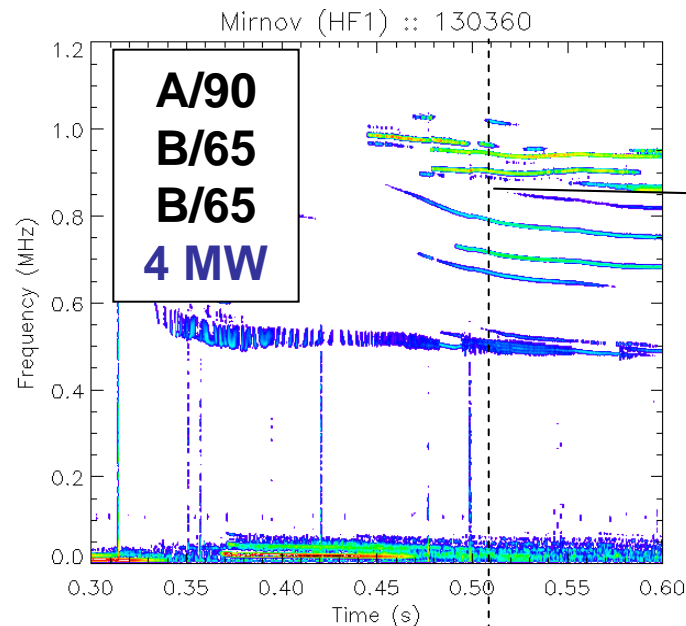
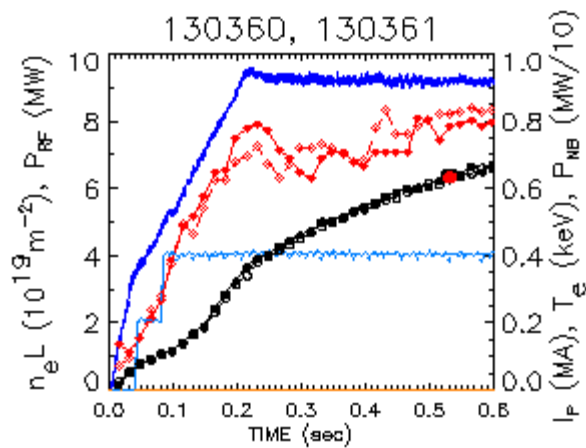
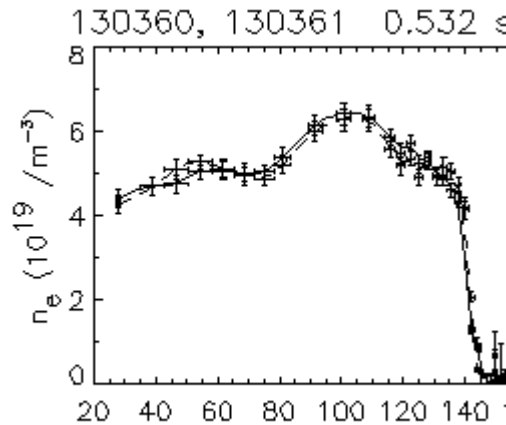
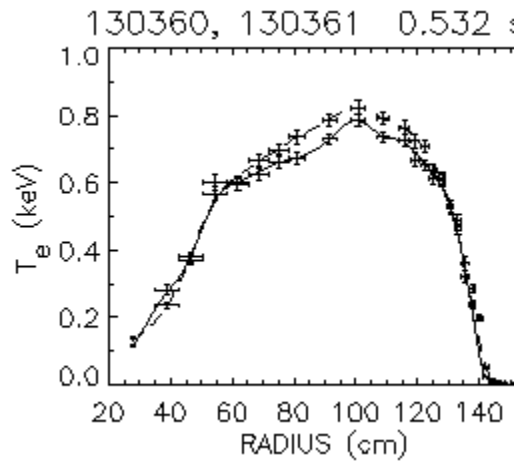


A/90
C/65
B/90
5 MW



- Not much high-k scattering

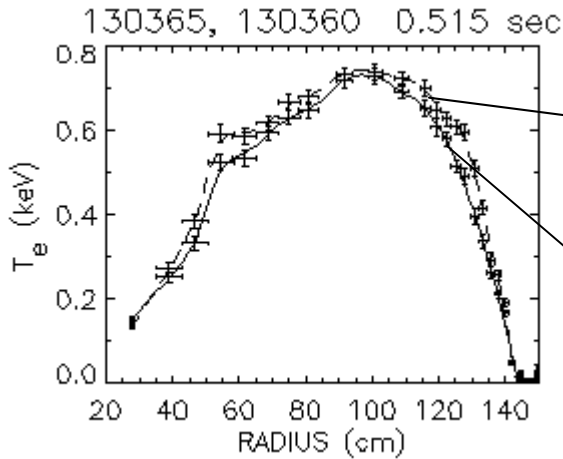
Plasmas with equal P_b at different V_b



- Similar T_e , but also not much AE difference

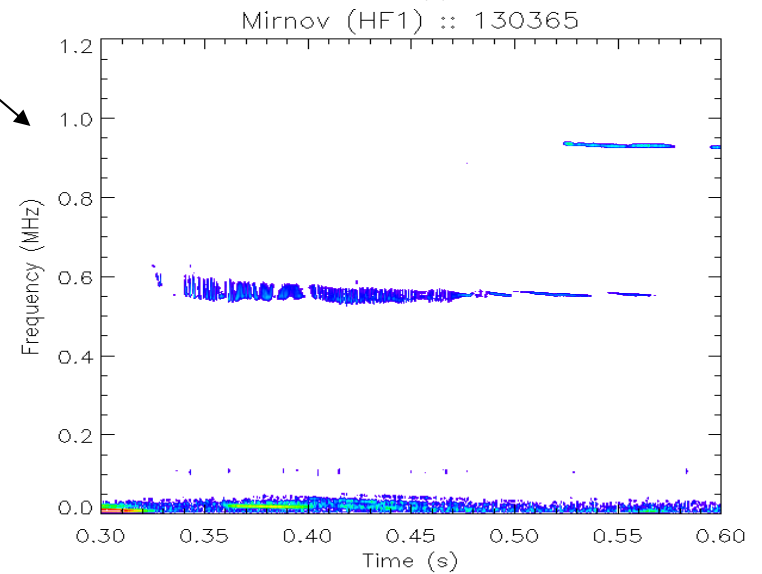
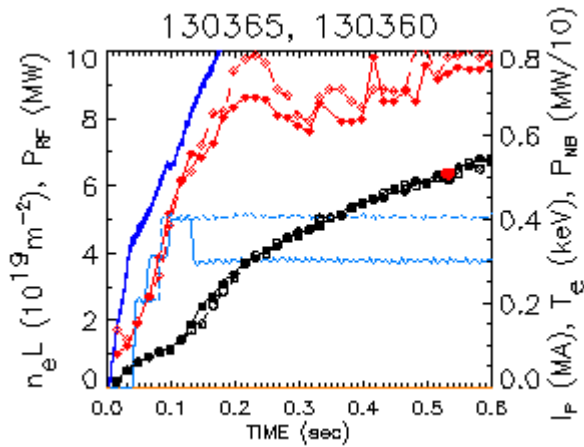
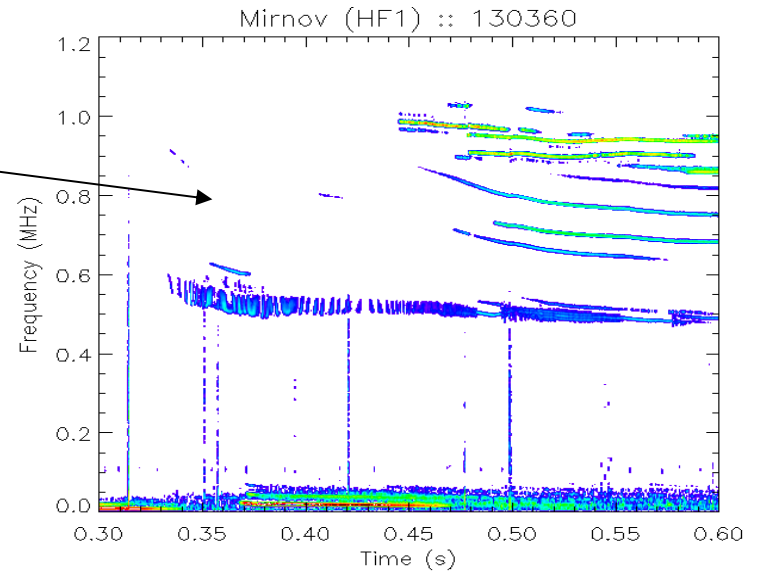
- Some electron transport improvement at low V_b possible

At low V_b plasma with less P_b has similar T_e



4 MW
A/90+C/90

3 MW
A/90+C/65



- Overall encouraging results