

Review of High Levels of Radiation Seen in XP 601

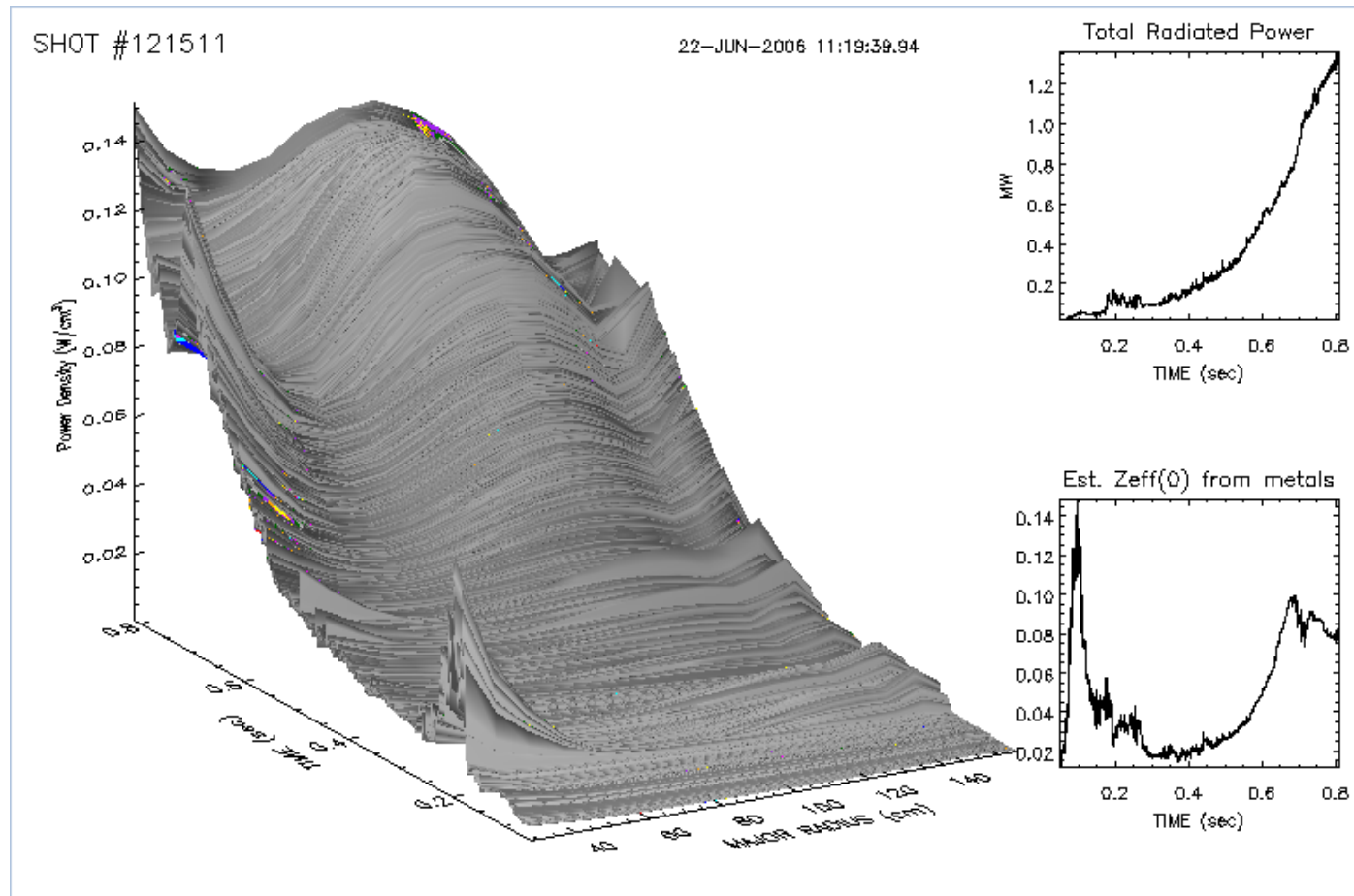


- High radiation was seen in the shots following the deposition; also on the preceding reference shots but not quite at as high a level
- ELM-free, MHD free discharges allowed impurities to build up in the core
- Bolometers detectors saturated on several of the shots so hard to determine the extent of the build-up
- Assuming a particle equilibrium, there is more than 1.5 times the amount of radiation that carbon can explain

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**High Radiated Power Density 150-200 mW/cc, Broad Profiles with Prad 1.5 - 2 MW.
Estimated $Z_{eff}(0)$ from metals is modeled assuming Iron and Coronal Equilibrium on axis.**

**Z_{eff} from metals is about .1, a relatively small contribution to total Z_{eff}
but after .5 sec, impurity emission increases faster than square of electron density**



XP601

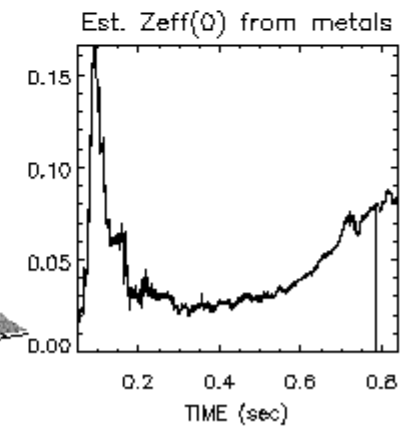
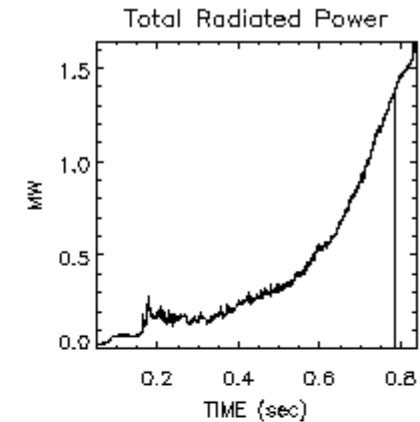
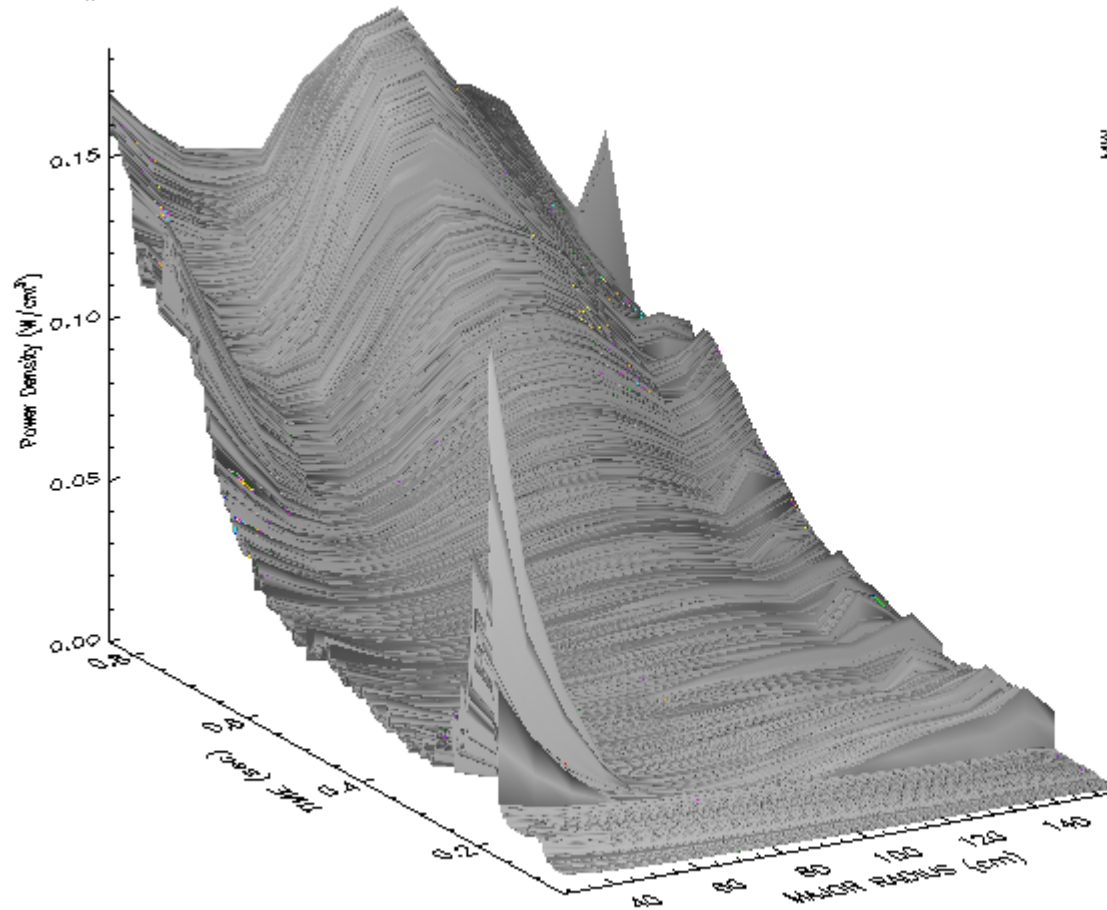
Shot number	neutral beam	Fe XVIII 94 Å measured	Fe XIX 101 Å measured	Fe XXII 133 Å measured	BOLOMETER Prad %	detectors saturated?	
121492	4 MW	?	?	?		saturated	no MHD, ELM's > .2 sec
121503	4 MW	?	?	?	> 35%	OK til very end	reference no MHD, ELM's
121504	4 MW	?	?	?	30%	OK	shots no MHD, ELM's until .8 seconds
<i>Li deposition 4.8 g</i>							
121507	4 MW	50	0	50	40%	OK	no MHD, ELM's > .35 sec
121508	4 MW	160	40	100	> 50%	saturated	no MHD, ELM's > .15 sec
121509	4 MW	180	60	75	> 50%	saturated	no MHD, ELM's
121510	4 MW	120	20	65	> 40%	saturated	no MHD, ELM's
121511	4 MW	70	15	50	35%	OK	global modes in at .8 sec
<i>Li deposition + 1 g</i>							
121512	4 MW	170	50	160	> 50%	saturated	no MHD, ELM's except small event at .65 sec
121513	4 MW	140	75	125	> 50%	saturated	no MHD, ELM's > .3 sec
121514	4 MW	100	25	90	> 42%	saturated	no MHD, ELM's
121515	4 MW	110	35	75	> 35%	saturated	no MHD, ELM's
121516	6 MW	0	0	0	< 7%	OK	MSE reversed global modes throughout the discharge
121517	4 MW	0	0	0	< 3%	OK	event at .7 seconds
121518	4 MW	0	0	0	11%	OK	shear global modes throughout the discharge
121519	2 MW	0	0	0	??	? Bad trigger?	shots
121520	??	3	0	7		OK	
<i>Li deposition + 1 g</i>							
121521	3 MW	160	70	170	> 50%	saturated	little MHD, localized event at .6 sec
121522	2 MW	0	0	0	< 5%	OK	XP 614 little MHD
121523	2 MW	0	0	13	< 5%	OK	quiet short shots
121524	2 MW	0	0	5	< 5%	OK	quiet short shots
121525	2 MW	0	0	5	< 5%	OK	quiet short shots
121526	6 MW	0	0	0	< 3%	OK	frequency global events
121527	6 MW	0	0	0	< 3%	OK	localized modes, little MHD
121528	6 MW	0	0	0	< 3%	OK	localized modes, little MHD
121529	6 MW	0	0	0	< 3%	OK	sporadic global events
121530	6 MW	0	0	0	< 3%	OK	one mode at .63 seconds

Reference shot, the day before XP601 was conducted.

**High Radiated Power Density 150-200 mW/cc, Peaked Profiles with Prad 1.5 - 2 MW.
Estimated $Z_{\text{eff}}(0)$ from metals is modeled assuming Iron and Coronal Equilibrium on axis.
 Z_{eff} from metals is $< .1$, a relatively small contribution to total Z_{eff}
but after .5 sec, impurity emission increases faster than square of electron density**

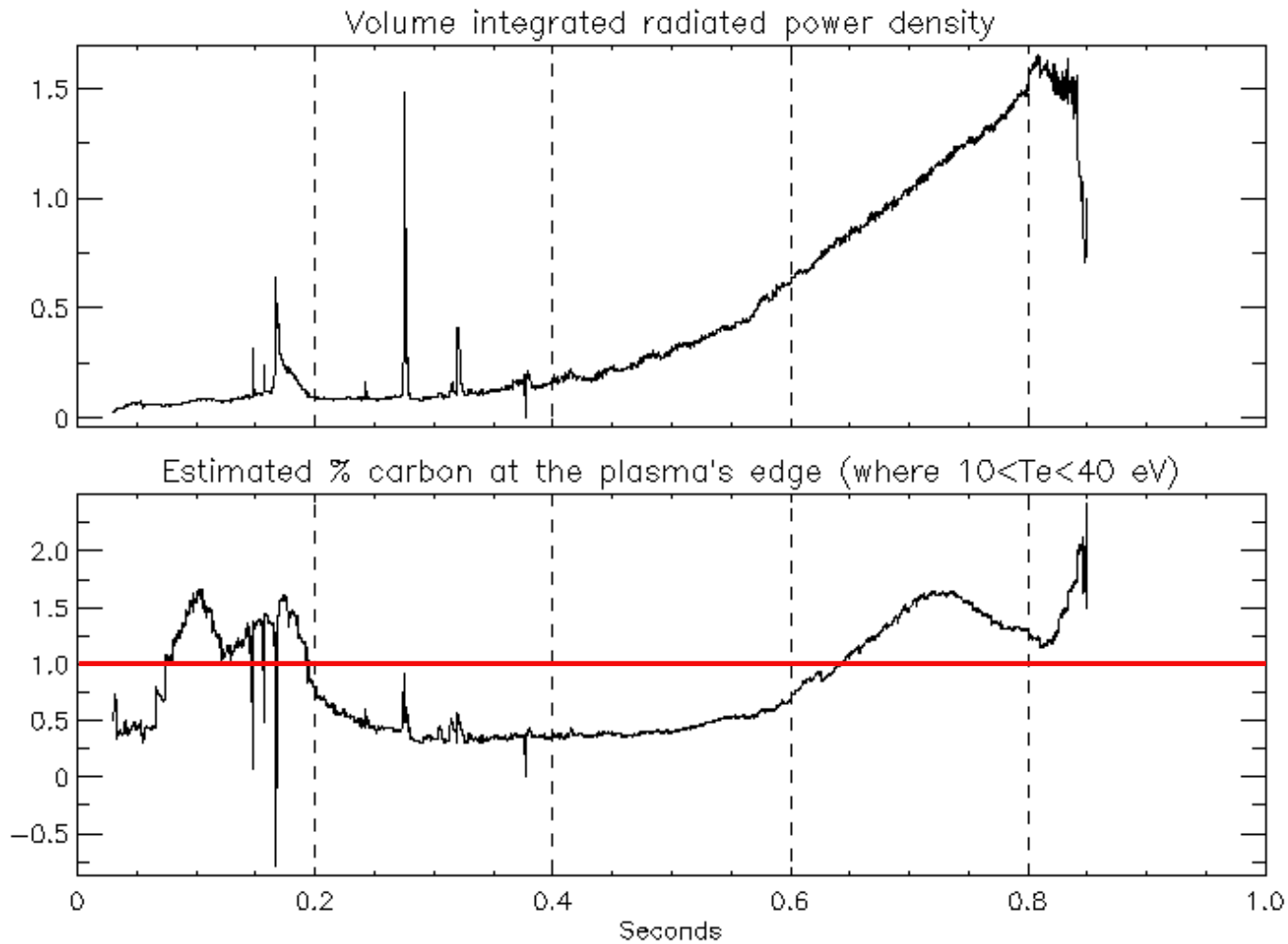
SHOT #121503

21-JUN-2006 18:49:37.72



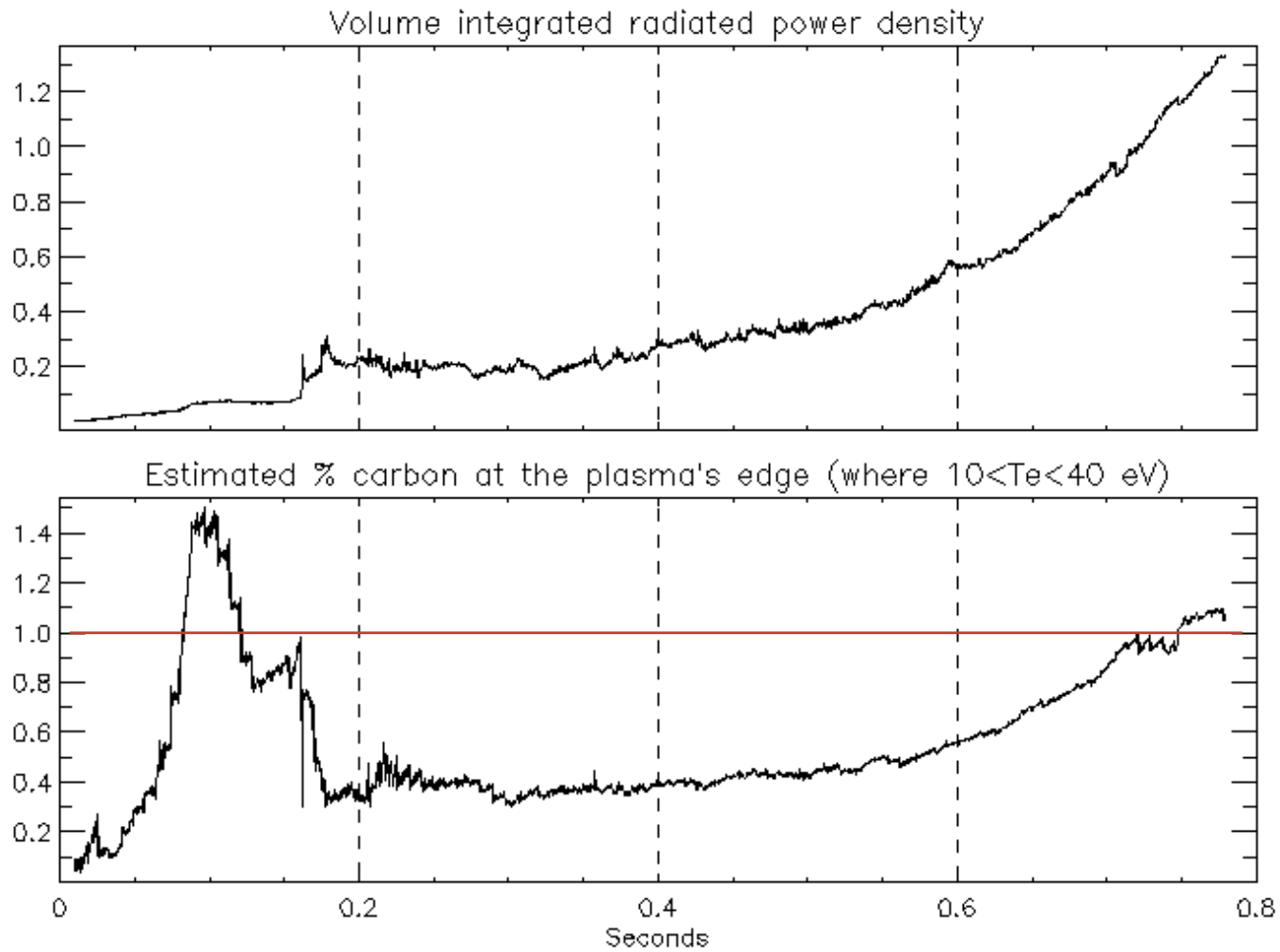
Immediately after the main Li deposition, Bolometer not saturated

Shots:
121507



Reference Shot from the day before

Shots:
121503



Bolometer channels begin to saturate at .679 sec

Shots:
121509

