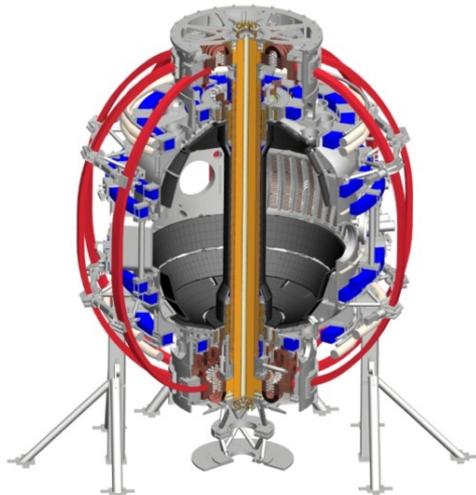


Data Analysis Tools for NSTX-U

Bill Davis
Stan Kaye

Physics Meeting
B-318
Aug. 26, 2013

Coll of Wm & Mary
Columbia U
CompX
General Atomics
FIU
INL
Johns Hopkins U
LANL
LLNL
Lodestar
MIT
Lehigh U
Nova Photonics
ORNL
PPPL
Princeton U
Purdue U
SNL
Think Tank, Inc.
UC Davis
UC Irvine
UCLA
UCSD
U Colorado
U Illinois
U Maryland
U Rochester
U Tennessee
U Tulsa
U Washington
U Wisconsin
X Science LLC



Culham Sci Ctr
York U
Chubu U
Fukui U
Hiroshima U
Hyogo U
Kyoto U
Kyushu U
Kyushu Tokai U
NIFS
Niigata U
U Tokyo
JAEA
Inst for Nucl Res, Kiev
loffe Inst
TRINITI
Chonbuk Natl U
NFRI
KAIST
POSTECH
Seoul Natl U
ASIPP
CIEMAT
FOM Inst DIFFER
ENEA, Frascati
CEA, Cadarache
IPP, Jülich
IPP, Garching
ASCR, Czech Rep

Overview



- Web Tools in depth
 - Overlaying in different ways
 - Browsing Fast Camera data
- EFITmovies and EFITviewer
- New ways to visualize data like MPTS
- Databases at PPPL and DbAccess features
 - Shot summaries and other tables of general interest available
 - Creating your own
 - Find shots based on EFIT parameters or other signals
 - Search for entries in the NSTX Logbook
- Other ways to visualize NSTX data
- What other tools should be developed?

Web Tool access at <http://nstx.pppl.gov/nstx/Software/WebTools>

Designed for ease-of-use:

LOOKING AT MDSplus DATA

- [PLOTING OPTIONS](#)
- [SEARCHING/COMPARING/LISTING](#)
- INFORMATION ABOUT DATA**
- [LOGBOOK searching/viewing with Plot Summaries](#)
- [FINDING SIGNAL NAMES from Label list](#)
- [SHOT LISTS](#)
 - by XP
 - by XMP
 - by Date of Calibration shots
- [Accessing TRANSP data in MDSplus](#)
- [List of some MDSplus events used on NSTX](#)
- RELATIONAL DATABASE DATA**
- [TF Tools](#)
- [Find shots based on EFIT parameters](#)
- [TRANSP Run Listings](#)
- [EFIT and LRDfit runs by owner](#) **New!**

MISCELLANEOUS

- [Setting up TRANSP runs](#)
- [NSTX Controls Software Information](#)
- [NSTX Status Page](#) **New!**
- [Launch EPICweb](#) **New!**
- [NSTX Control Room Monitoring](#) **New!**

Access to Plotting Web Tools



[mdsPlotList](#), Web Tool for Plotting Signals OR Listing MDSplus Data for NSTX (**BEST**) ([20-signal version](#)). You can also [plot from different servers](#).

[mdsMultiSig](#), ([example](#)) for Plotting Multiple MDSplus Signals **on the same Frame**. Timebases are automatically converted **Wow** for math on signals ([20-signal version](#)).

[mdsSignals_clean](#), NSTX MDSplus Signal Plotting (doesn't remember previous settings)

[mdsPlot1](#), NSTX MDSplus Plotting Tool (for various "canned" plots)

[mdsScopeAdj](#), NSTX MDSplus **Adjustable Scope** Plotting Tool (plots in a new window) (**BEST for scopes**)

[mdsScope_clean](#), NSTX MDSplus Scope Plotting Tool (doesn't remember previous settings)

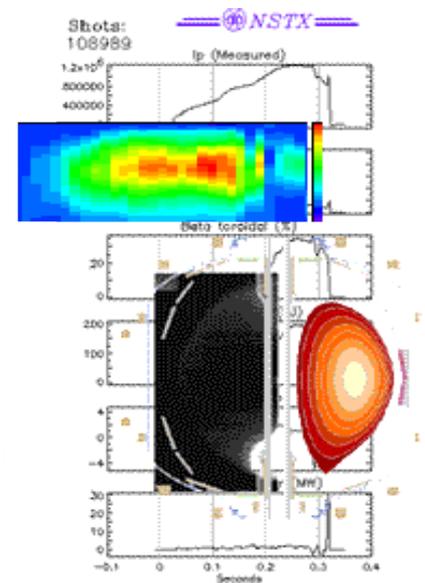
[mdsCrossPlot](#), Plot One MDSplus Signal vs. Another. Optionally display X-axis as HH:MM.

[Flux Cross-sections](#) **IMPROVED**, NSTX **EFIT/LRdfit** Flux and Thomson Data Plotting

[MPTplots](#) (or [mptsColorCont](#) ([example](#))) NSTX Multi-point Thomson Data Plotting

[NSTX Fast Camera Movies](#) **NEW!** 1 or 2 cameras with optional [overlays of MDSplus signals](#).

[NSTX RGA Trend Data](#) **NEW!** ([example](#))



Overlaying Te Profiles from different shots

NSTX MDSplus Multiple Signal Plotting

Plot different MDSplus Signals on the same plot frame. ([example 1](#) [example 2](#))

When math is performed on signals on different timebases, conversion to the coarser timebase is automatic.

Shot Number(s): > (arrows plot shot before or after)

For tips on convenient shot entry methods, see [ShotEntryHelp.html](#). ([search for desired shot numbers](#))

Paste a Column of signals from the clipboard	Paste All 4 Columns	Help
Enter Signal(s) with tree name, e.g., \wf::ip	Y: (autoscale if blank)	Plot #
<input type="text" value="\activespec::tes[0.23,*]"/>	from <input type="text"/> to <input type="text"/>	<input type="text" value="1"/>
<input type="text"/>	from <input type="text"/> to <input type="text"/>	<input type="text" value="1"/>
<input type="text"/>	from <input type="text"/> to <input type="text"/>	<input type="text" value="1"/>
<input type="text"/>	from <input type="text"/> to <input type="text"/>	<input type="text" value="2"/>
<input type="text"/>	from <input type="text"/> to <input type="text"/>	<input type="text" value="2"/>

-> For signal names see the [NSTX Signals and Labels page](#) or the [MDSplus Tree Search Tool](#).

Plot Ranges: X: Autoscale from to (sec., points, etc.)

Plot Labels: From MDSplus Tag Names None

Size of Plot Window: Horizontal: Vertical: (pixels)

Output Desired:

- Plots
 Numerical Listing

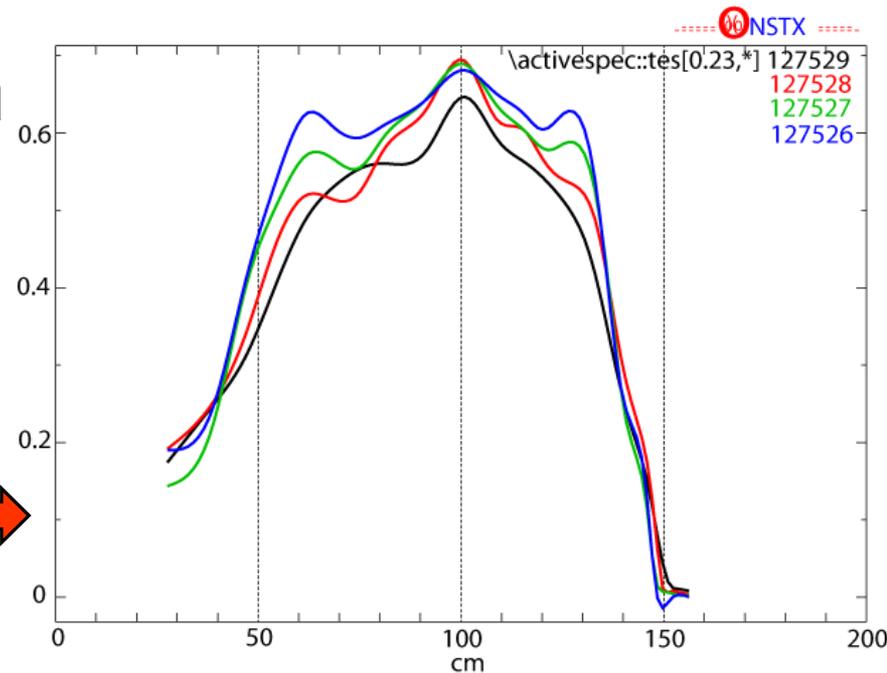
Plot File:

None Postscript PDF
named: +ext

Output File Font:

E-mail file to: keep aspect ratio same as plot window.

Reset



<http://nstx.pppl.gov/nstx/Software/WebTools/mdsmultisig.html>

NSTX MDSplus Multiple Signal Plotting

Shot Number(s): (arrows inc. shot)

Paste signals or Paste All 4 Columns [Help](#)

Enter Signal(s) with tree name Y: Plot #

<input type="text" value="/usr::usr_hup_00"/>	from	<input type="text"/>	to	<input type="text"/>	<input type="text" value="1"/>
<input type="text" value="/usr::usr_hup_00+100"/>	from	<input type="text"/>	to	<input type="text"/>	<input type="text" value="1"/>
<input type="text" value="/usr::usr_hup_00+200"/>	from	<input type="text"/>	to	<input type="text"/>	<input type="text" value="1"/>
<input type="text" value="/usr::usr_hup_00+300"/>	from	<input type="text"/>	to	<input type="text"/>	<input type="text" value="1"/>
<input type="text" value="/usr::usr_hup_00+400"/>	from	<input type="text"/>	to	<input type="text"/>	<input type="text" value="1"/>
<input type="text" value="/usr::usr_hup_00+500"/>	from	<input type="text"/>	to	<input type="text"/>	<input type="text" value="1"/>

(See the [MDSplus Tree Search](#) to find signal names)

Plot Ranges: X: Auto from to (sec., points, etc.)

Plot Labels: From MDSplus Tag Names None

Size of Plot Window: Horizontal: Vertical: (pixels)

Output type: Plot File:

None Postscript PDF

Output Font:

Plots

Listing

named: +ext



E-mail file to: maintain aspect ratio

Signal Units Displayed: None on Y-axis append to Title

Median-Smoothing Neighborhood: (Default: no smoothing)

Layout of Plots: # of rows: # of columns: (Blanks OK)

Color Indices for Lines:
(in IDL style, e.g., [20,40,60,80,100] or findgen(20)*10, or [use these](#))

IDL Color Table for Indices:

Styles for Lines: ([Help](#))

Symbols for Points: ([Help](#))

No NSTX Logo on plot

Display values of all X-axes

Optionally enter values 0-0.2 to adjust spacing between plots:

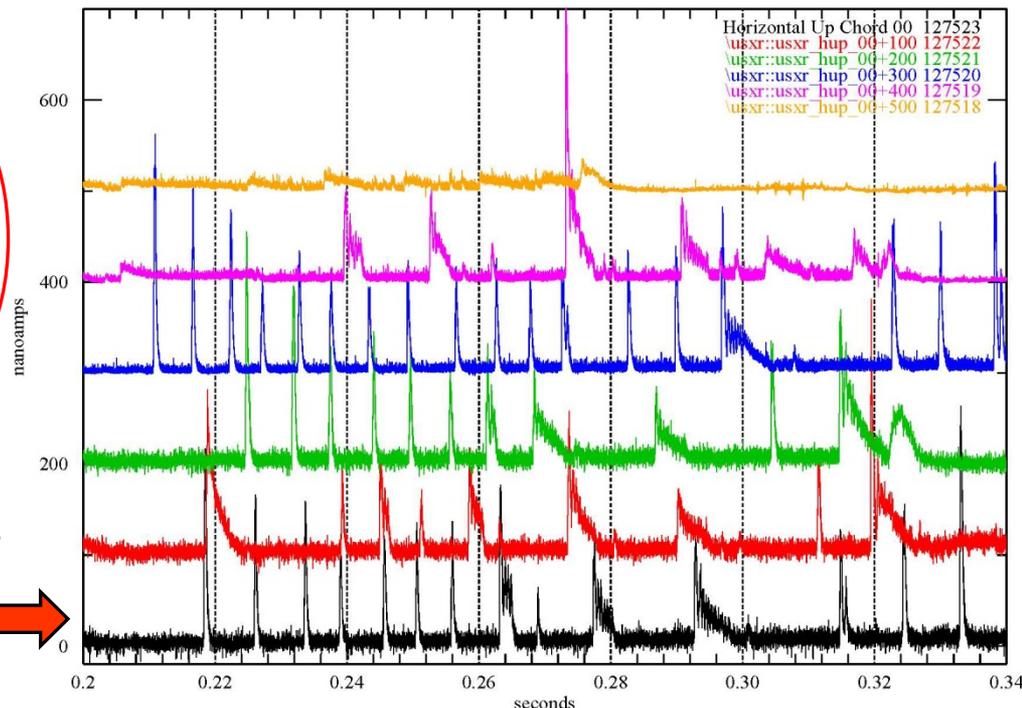
Fraction between columns: Fraction between rows:

Fraction at top of page: Fraction at bottom of plot:

Fraction to right of plots: Fraction to left of plots:

Expert Entry: of [plot keywords](#)

e.g., (Click to see examples)



<http://nstx.pppl.gov/nstx/Software/WebTools/mdsmultisig.html>

- Can overlay different shots of same signal, different signals of same shot, etc.

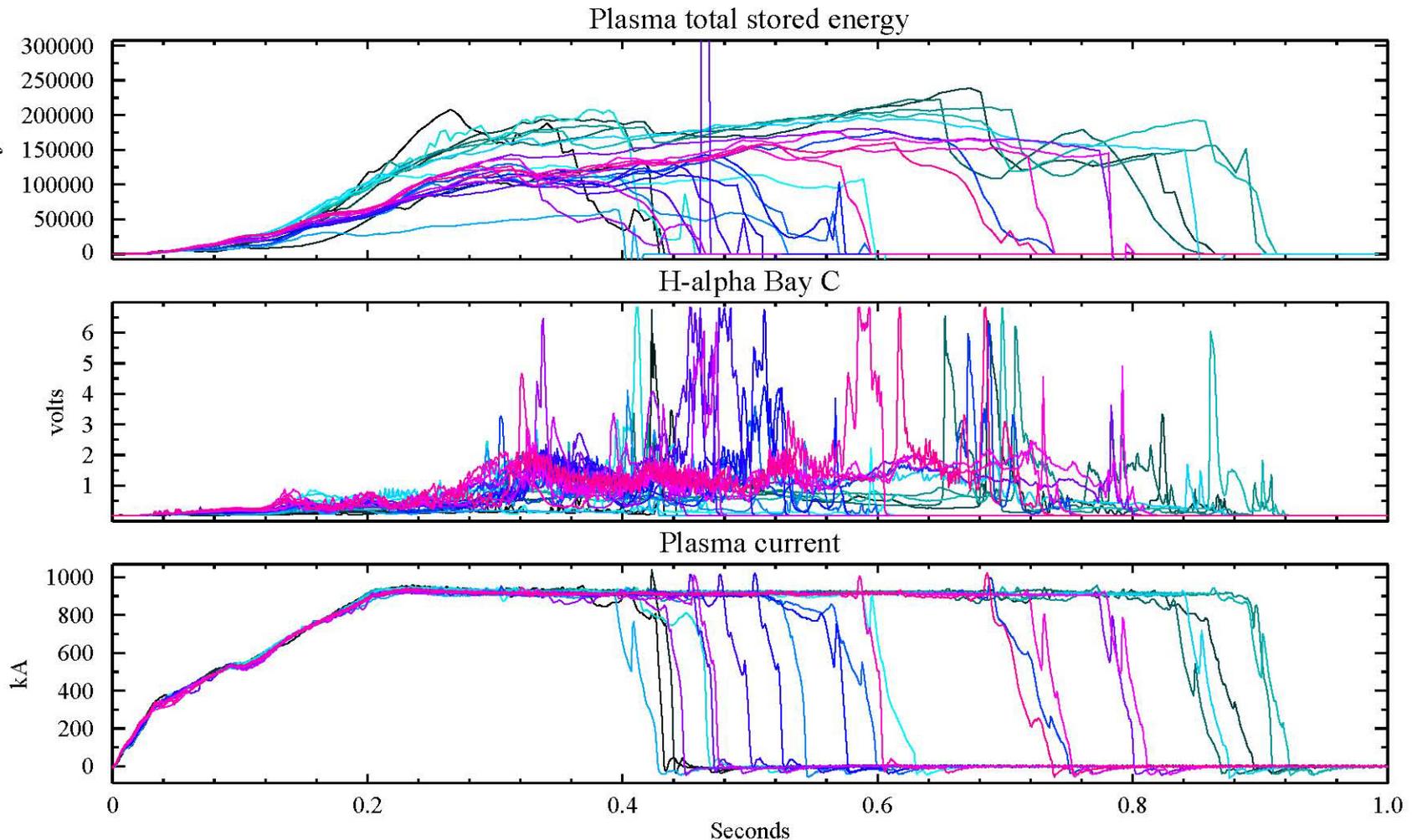
Web Tools plotting has many options

<http://nstx.pppl.gov/nstx/Software/WebTools/mdsplotlist.html>

Shot Number: "139816+23" Color Indices for lines: "findgen(24)/24*240" Color Table: "10"

Shots:

139816
139817
139818
139819
139820
139821
139822
139823
139824
139825
139826
139827
139828
139829
139830
139831
139832
139833
139834
139835
139836
139837
139838
139839

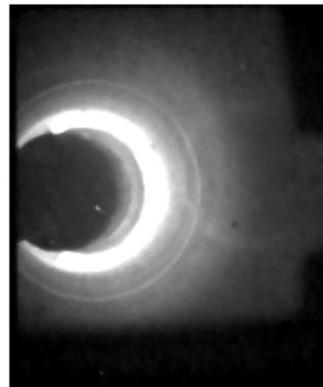
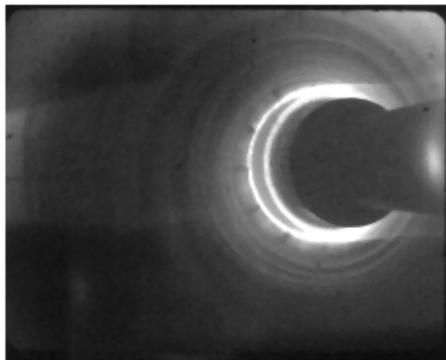
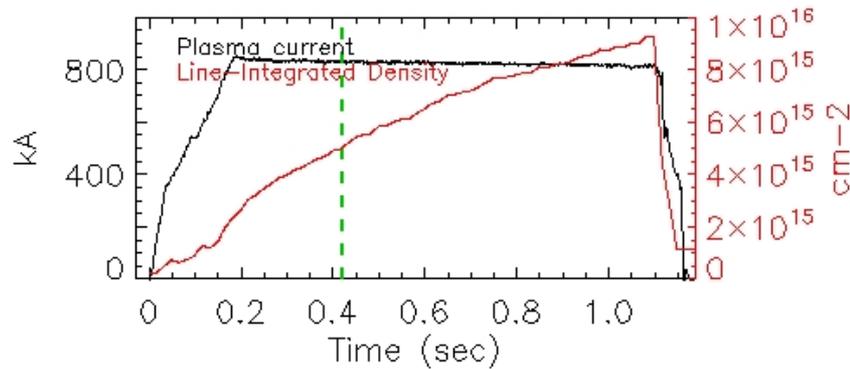


Multiple NSTX Camera images with plots

<http://nstx.pppl.gov/nstx/Software/WebTools/nstxmovies.html>



Shot 138767



Phantom710-9206 422.53 ms Phantom73-6663 422.65 ms



Thumbnail summaries of fast camera data

<http://nstx.pppl.gov/nstx/Software/WebTools/fcthumbnails.html>

software

- Overview
- Programming
- Diagnostics
- Applications
- FAQ
- Web Tools
- UNIX & VMS
- MDSplus

Create Thumbnails from NSTX Fast Cameras

(To use this page from outside the pppl.gov domain, you must be [authenticated at the firewall](#))

Enter information and click on the CREATE box, below.

Shot Number: [search for desired shot numbers](#) or [see shots with fastest capture for 2010](#).

Select Camera:

Phantom710-9206
Miro2-7988
Phantom73-6663
Phantom73-8032
Phantom710-9205 (GPI)
Miro4-9373
Phantom4-6878

[List of common camera locations in 2010](#)

Time: to sec (if blank will do for GPI range)

Show separatrix and limiter shadows

of frames wanted:

Min to show: Max to show:
(if frames all black, set max-to-show lower, like to 255)

Smoothing:

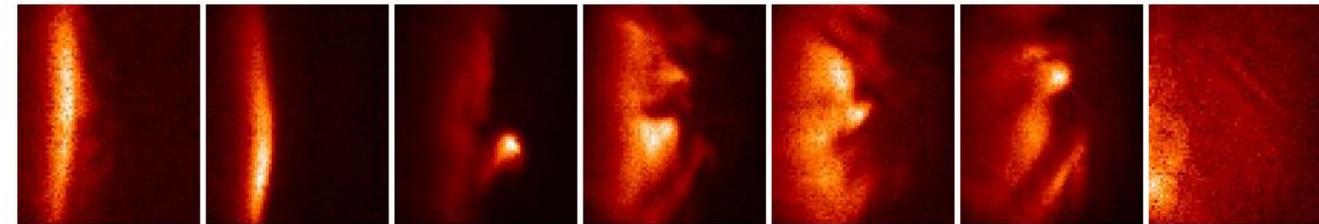
Rotate: Flip Horizontally

Size of Plot Window: Horizontal: Vertical: (pixels)

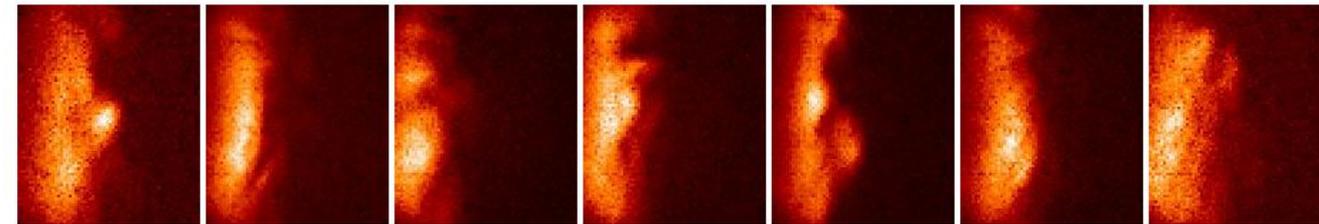
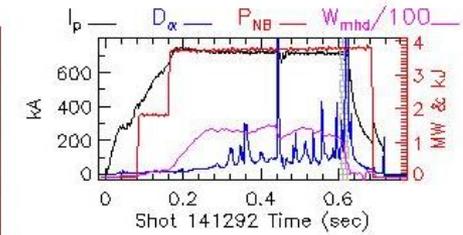
Gamma:

Saturation (for color images): [Help for these parameters](#)

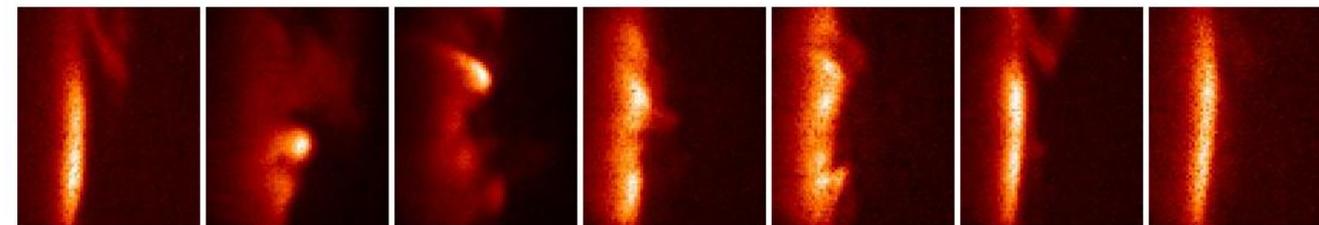
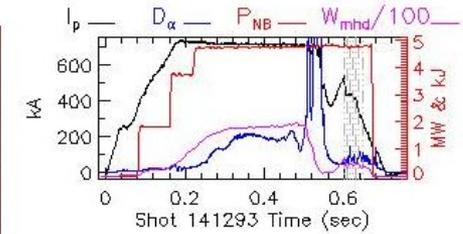
Sample from GPI thumbnails.pro



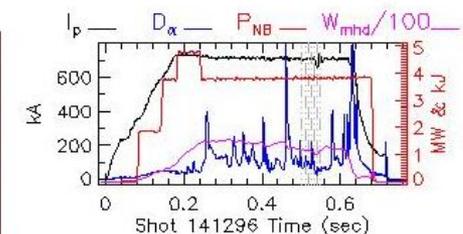
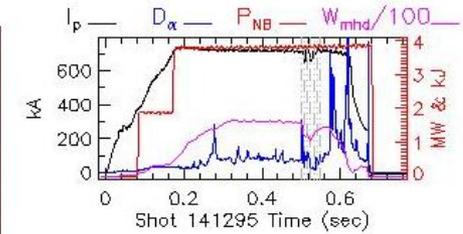
(thumbnails) Shot 141293, at 600, 608, 615, 623, 631, 639, 647 ms:



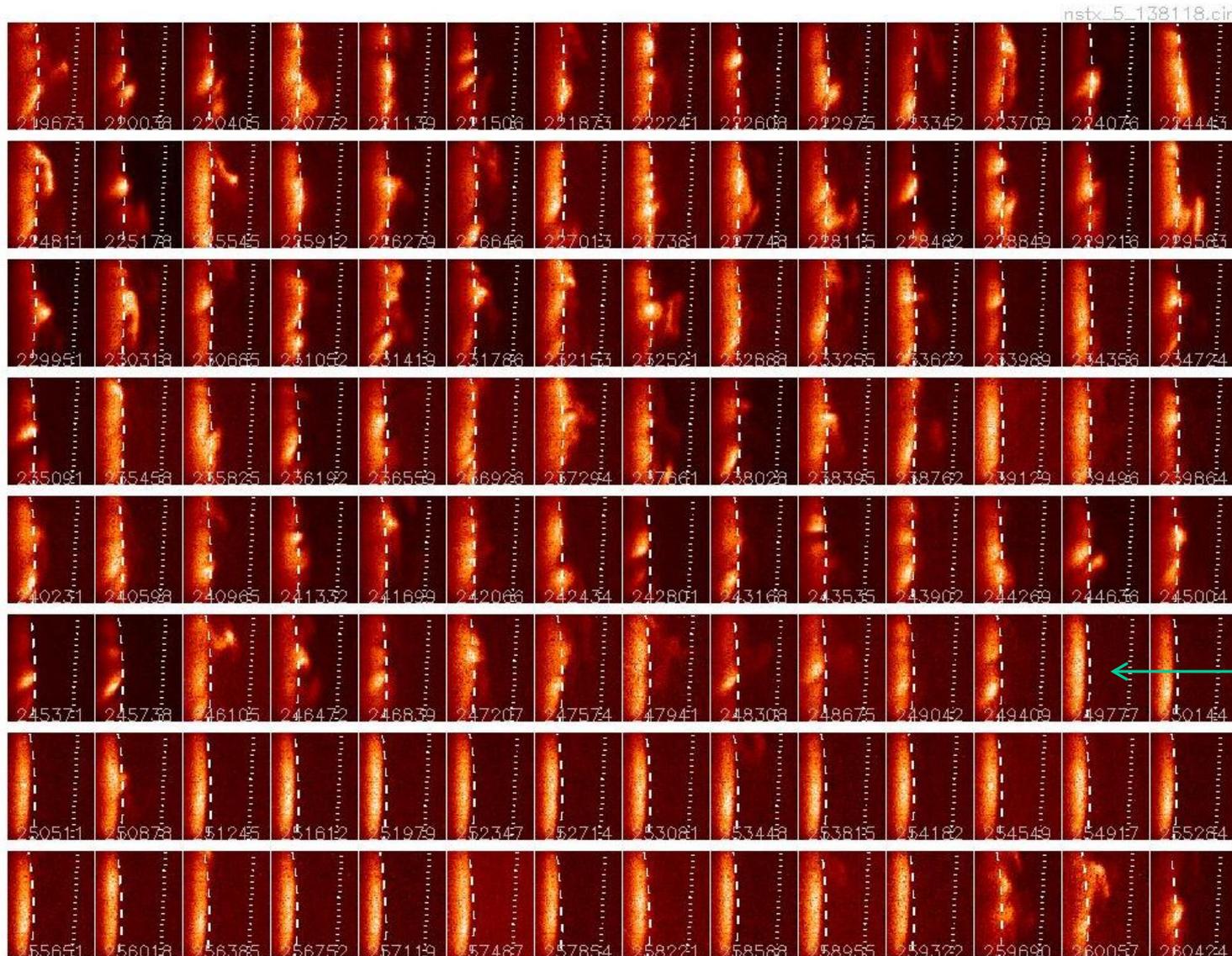
(thumbnails) Shot 141295, at 501, 508, 516, 524, 532, 540, 547 ms:



(thumbnails) Shot 141296, at 502, 510, 518, 526, 534, 542, 550 ms:



Sample from FCthumbnails.html



Easy to spot the L-H transition, indicated by the suddenly stable edge

IDL analysis tools tend to be more detailed

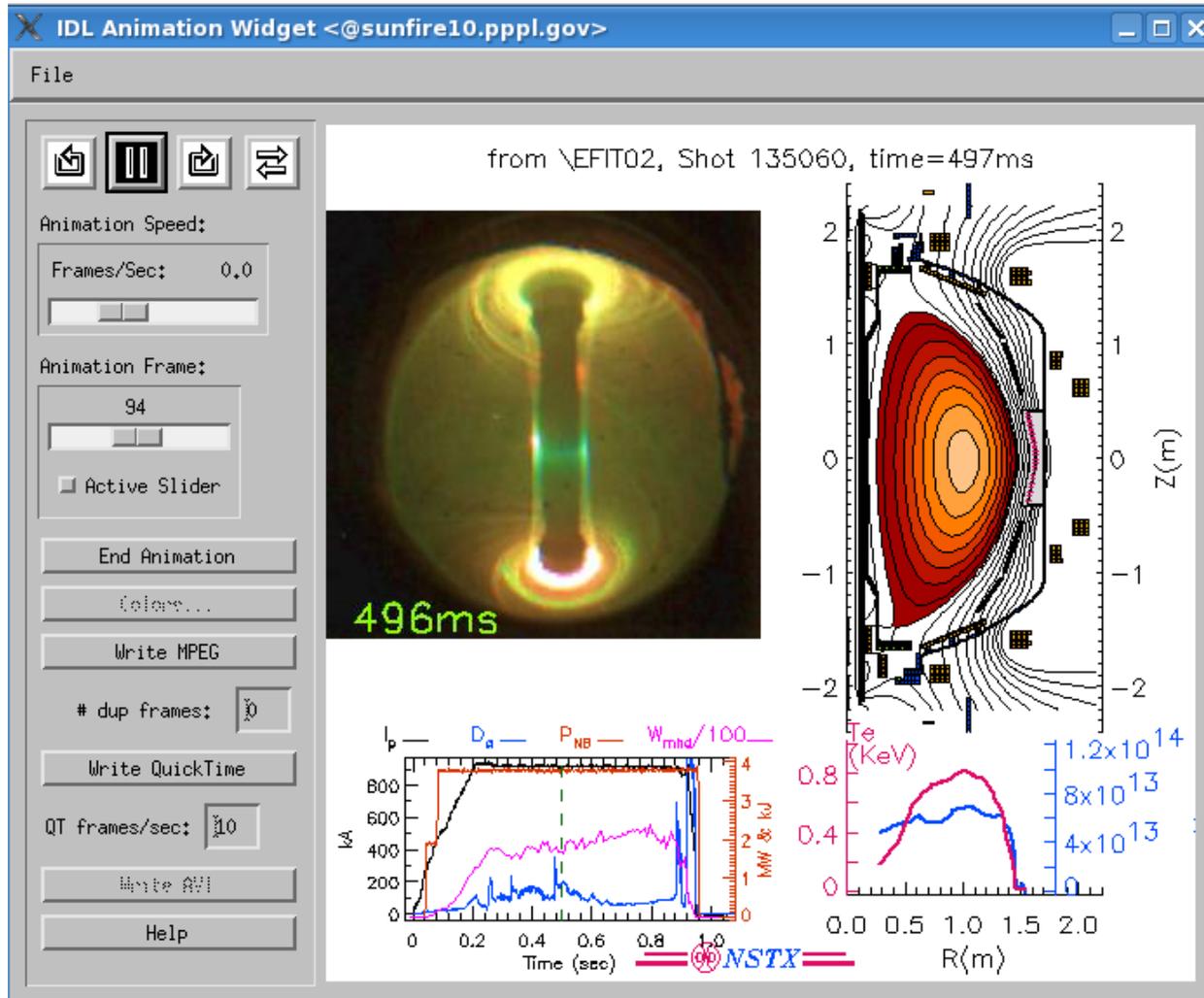
- Can be run directly on your PC or Mac, but easiest to run IDL on the PPPL Linux cluster
- Start with “module load nstx”
- Mouse can be used for zooming, examining data values, etc.
- Be careful of appending additional directories to the IDL_PATH definition from others!



EFITmovies.pro plots many things synchronously

Created in IDL in X-windows on the PPPL Linux cluster by:

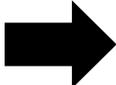
IDL> efitmovies, "miro*135060", /thomson, /summary

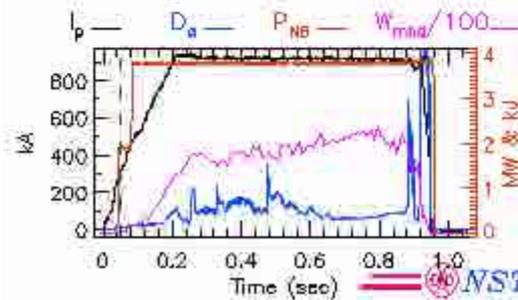
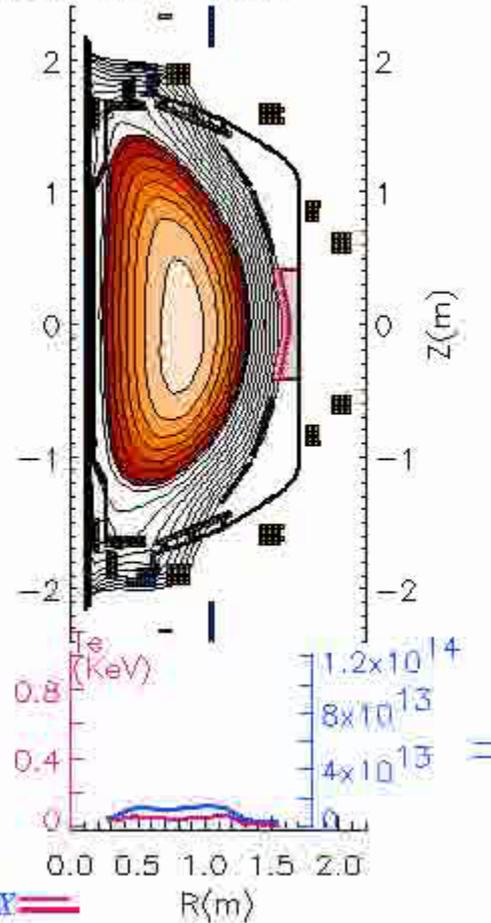
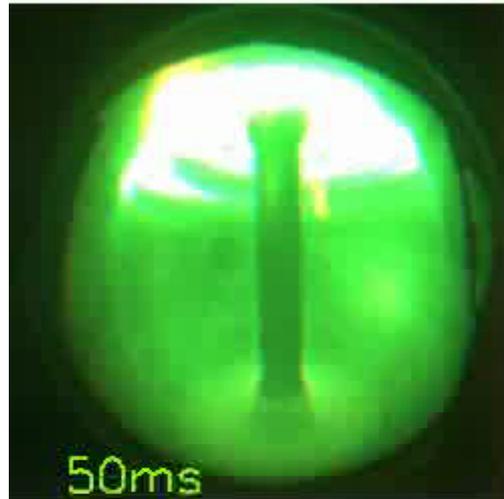


EFITmovies.pro plots many things synchronously

Movie saved from previous screen:

from \EFIT02, Shot 135060, time= 49ms

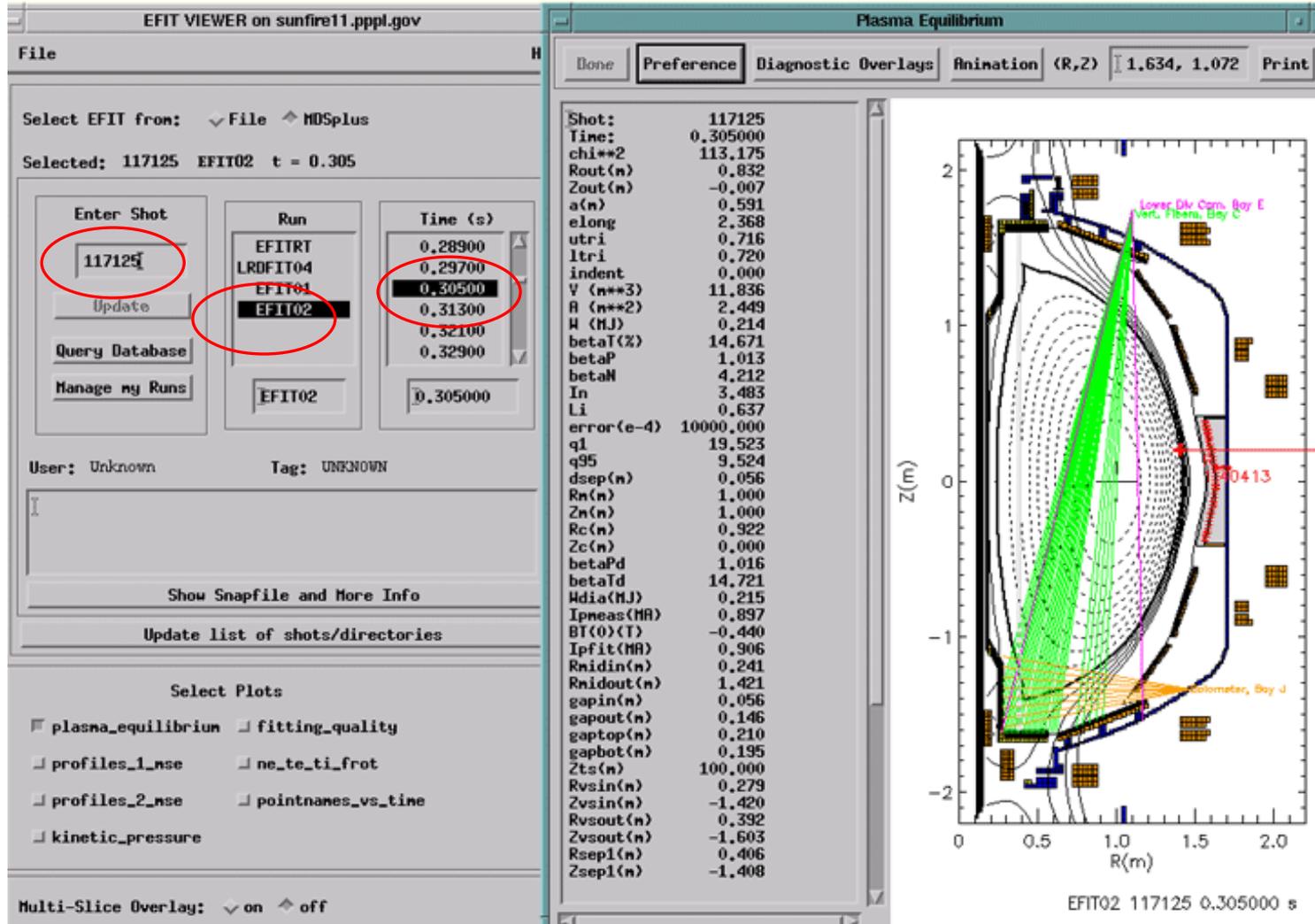
Click to play 



EFITviewer (from GA) shows plasma flux in relation to vessel and diagnostic site lines

% efviewer

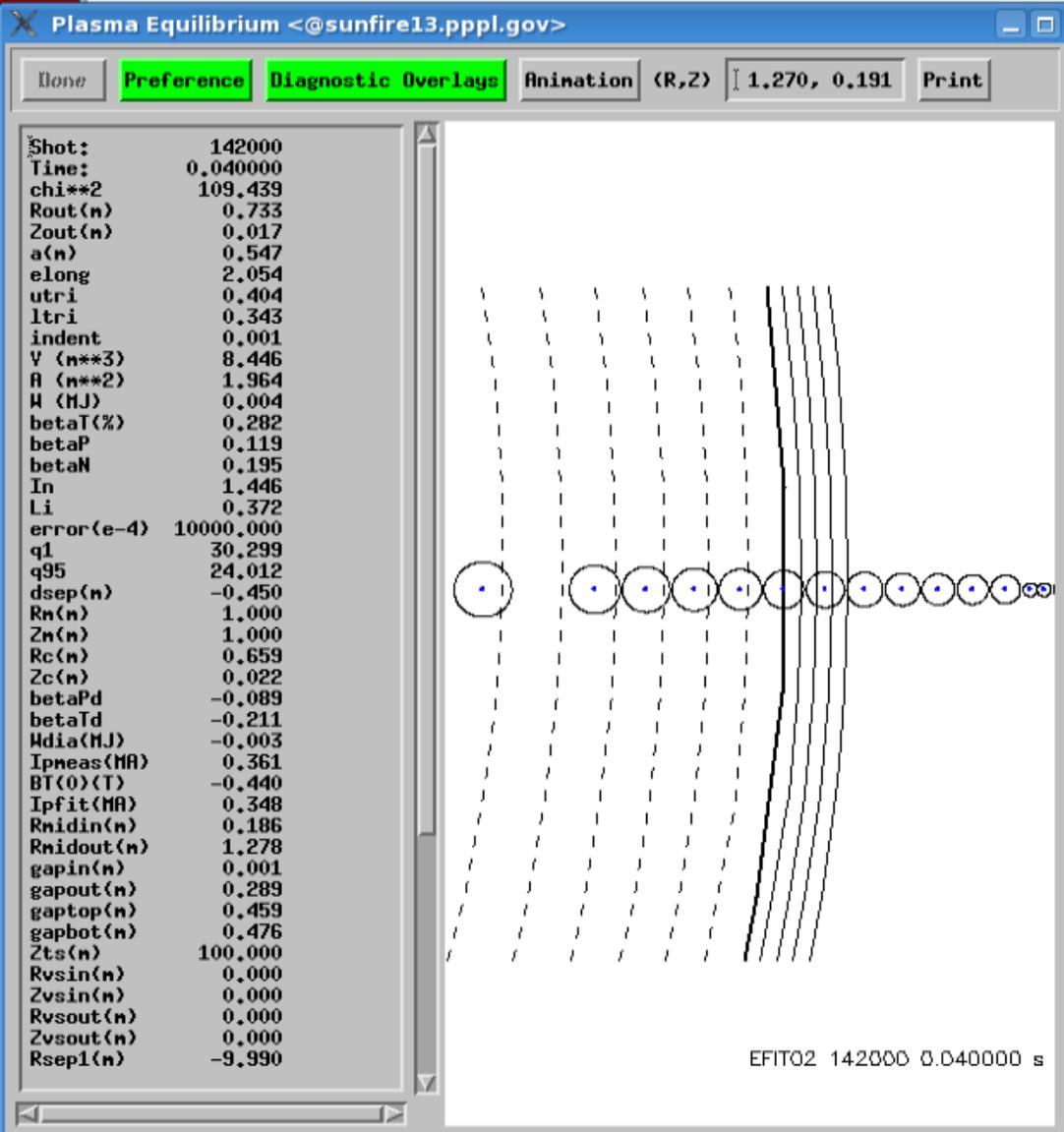
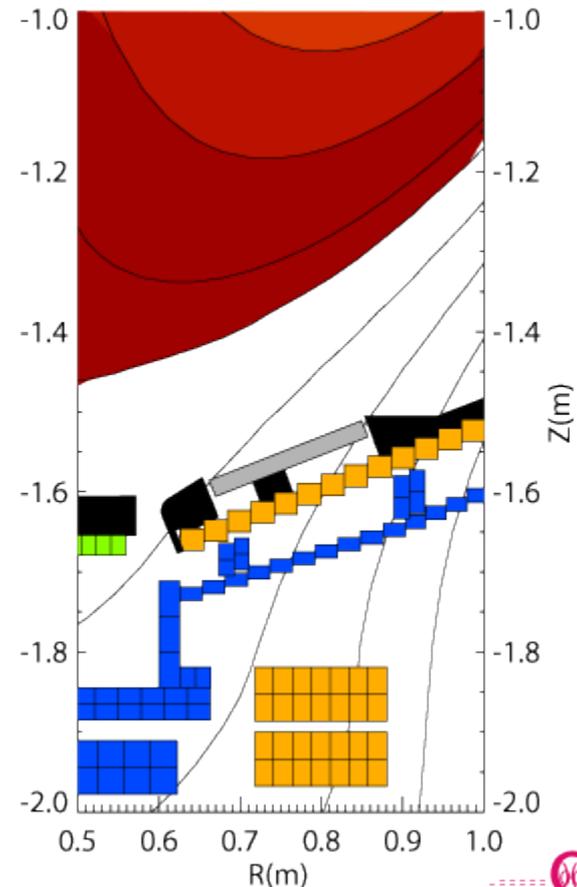
(entered at the Linux prompt)



EFITviewer - zoom in to see MPTS locations, strike points, e.g.

Ctrl-clicking on the plot will print out the R and Z coordinates

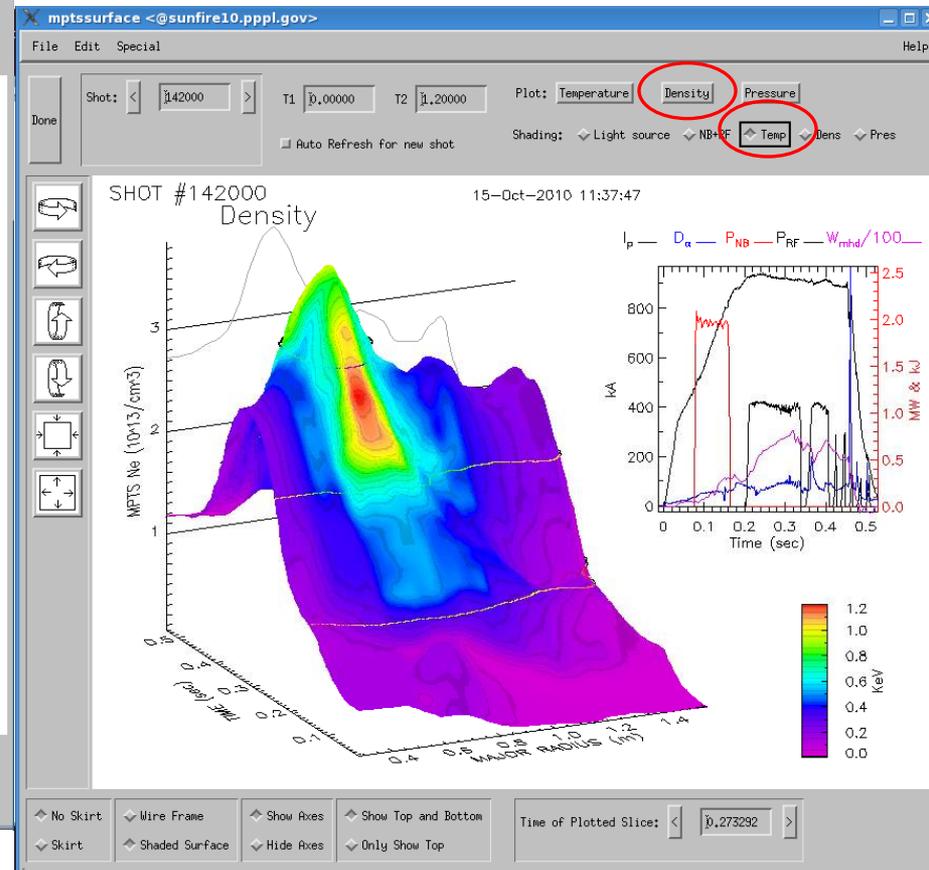
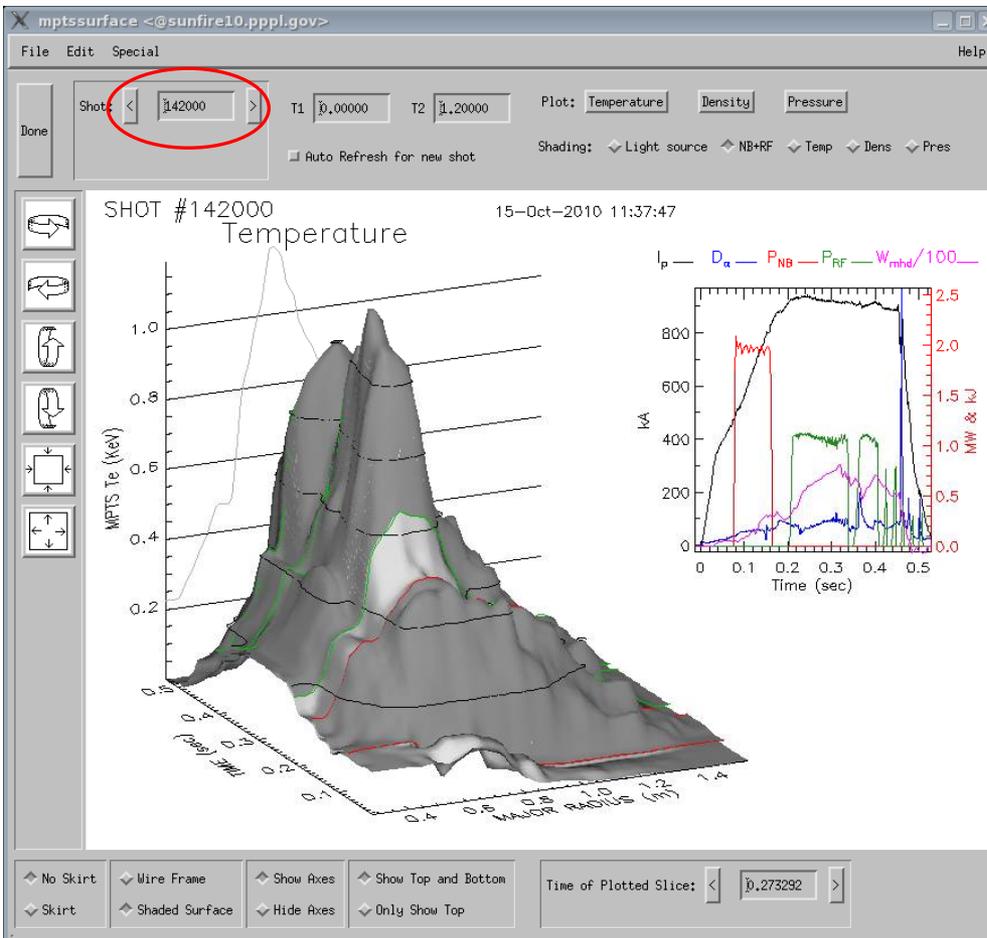
from \EFIT02, Shot 137702, time=196ms



Various ways to look at Thomson Data

IDL> mptssurface, 142000, /project

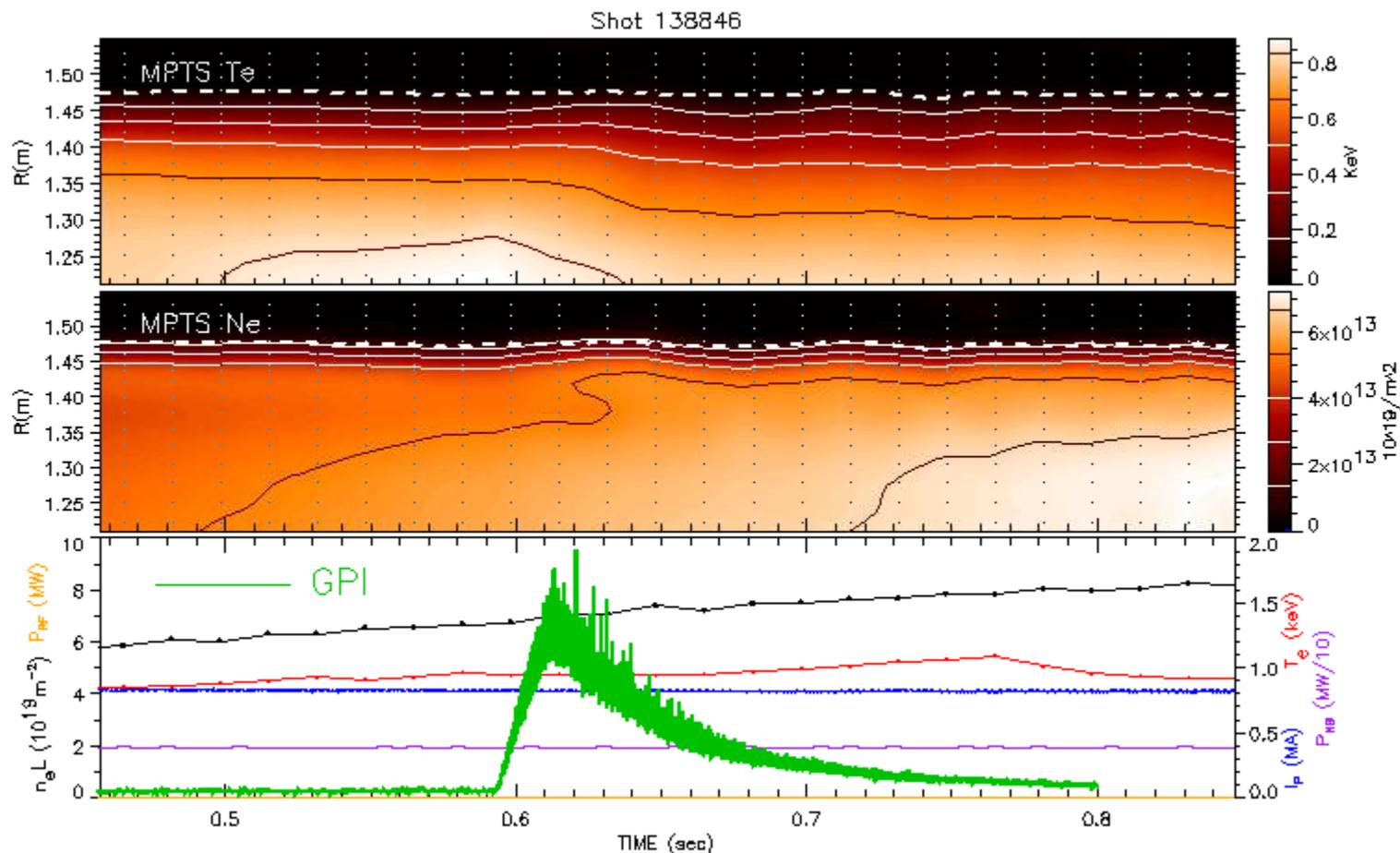
After clicking on “Plot: Density” and “Shading: Temp”:



Thomson Data - Can zoom in, e.g., to see edge effects

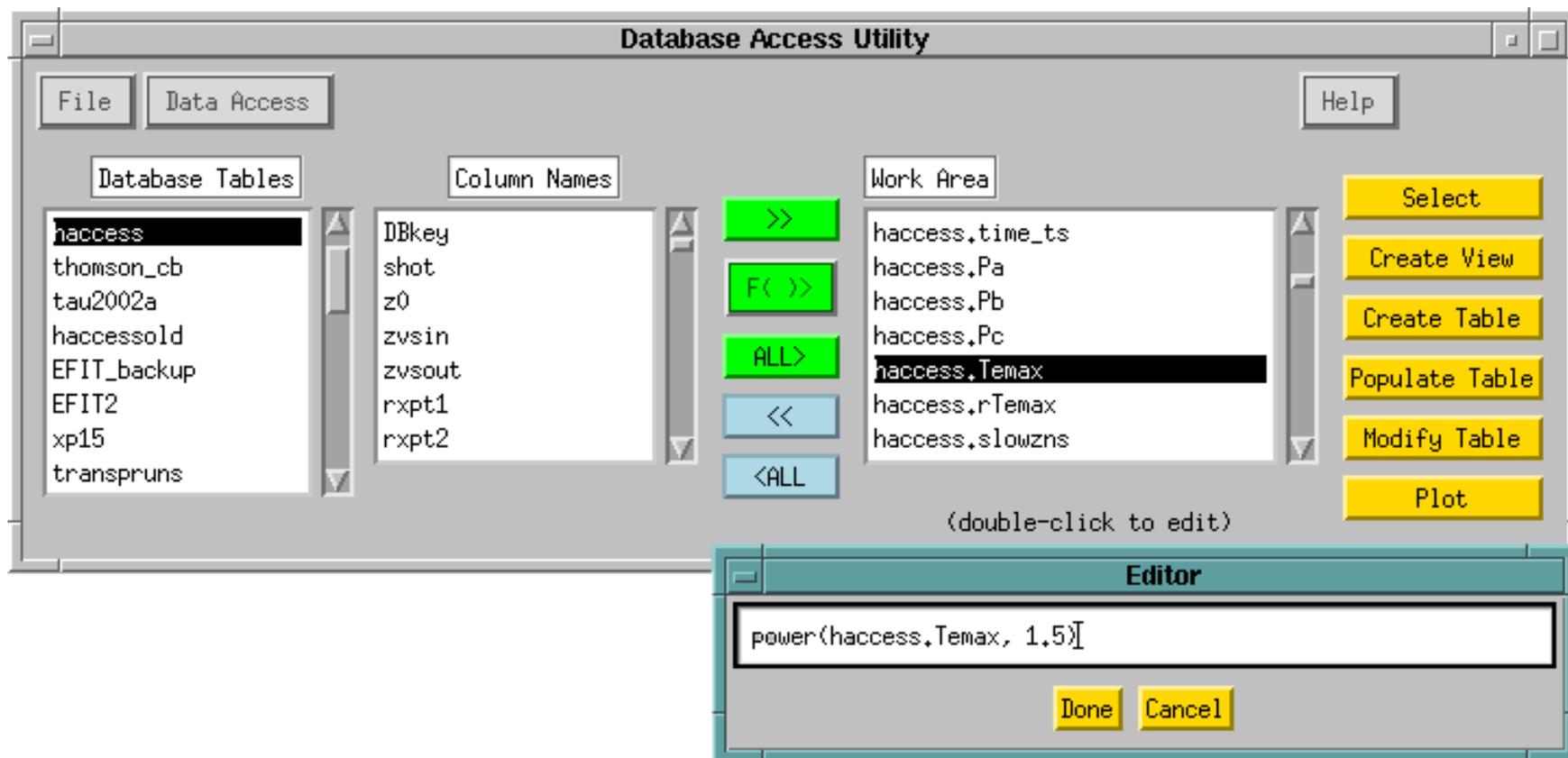
Created in IDL in X-windows on the PPPL Linux cluster by:

```
IDL> plot3_mpts,138846,/GPI,tmin=.45,tmax=.85,r1=1.2,r2=1.56,/contour,Plot_ip=0
```



Database Access via Point-and-click

IDL> dbaccess



Manual available at:

<http://nstx.pppl.gov/nstx/Software/Documents/dbaccess.html>

“Public” tables available in the NSTXLOGS Database

- “Survey” table contains a few dozen parameters at 3 times of interest (FlatTop, MaxIp, RampUp) for each shot
- EFITnn tables contain most of the EFIT parameters at 6 times of interest for each shot
- Neutron production
- XP-specific tables
- “Haccess” table contains parameters related to H-mode
- Blob database contains blob characteristics for NSTX and CMOD shots
- (Better organization and documentation of existing public tables are needed)



Column descriptions can be described in the “Contents” table of the NSTXLOGS Database

- Selection for the “Contents” table in DbAccess:

COLUMN	CONTENTS.DESCRPTION	SOURCE	TABLE	UNITS
Table: Survey		D. Mastrovito/S. Kaye	Survey	
baye_bii	Boron II emissivity from filterscope	\passivespec::baye_bii_fscope	Survey	AU
bt	Total TF current	\engineering::pc_tf_tot_cur	Survey	Amperes
bayc_cii	Carbon II emissivity from HAIFA	\passivespec::bayc_cii_haifa	Survey	AU
bayc_ciii	Carbon III emissivity from filterscope	\passivespec::bayc_ciii_fscope	Survey	AU
dalfal	Lower divertor Da emission	\passivespec::bayc_dalf_haifa	Survey	AU
dalfamp	Midplane Da emission	\passivespec::bayg_dalf_haifa	Survey	AU
dalfau	Upper divertor Da emission	\passivespec::baye_dalf_haifa	Survey	AU
bayg_heii	Helium II emissivity from filterscope	\passivespec::bayg_heii_fscope	Survey	AU
ichi	CHI injector current	\ENGINEERING::pc_chi_tot_cur_1	Survey	Amperes
ip	Plasma current	\engineering::ip2	Survey	Amperes
nel	Line integral density	\microwave::line_density	Survey	cm-2
baye_oi	Oxygen II emissivity from filterscope	\passivespec::bage_oi_fscope	Survey	AU
pinj	Total injected neutral beam power	\nbi::nb_p_inj	Survey	MW
prad	Total radiated power from bolometer	\passivespec::bolom_totpwr	Survey	MW
prf	Total injected HHFW power	\rf::hhfw_power	Survey	MW
shot	Shot number	mdsvalue(current_shot(nstx))	Survey	
time	Time of beginning of store phase of shot	mdsvalue(shot_date(\$ shot))	Survey	sec
toi	Time of interest	nstx\$:[db]times.dat	Survey	
vchi	CHI injector voltage	\OPERATIONS::chi_voltage	Survey	Volts
vloop	Loop voltage	\operations::v_flohm	Survey	Volts
Table: XP19		S. Kaye	xp19	
bt	Vacuum toroidal field at the geometric center		xp19	T
ip	Plasma current		xp19	MA
nebar	Line averaged density		xp19	10 ¹⁹ m ⁻³
phase	Phase of discharge		xp19	
pnbi	Injected neutral beam power		xp19	MW
poh	Ohmic heating power		xp19	MW
q95	q at 95% flux surface		xp19	

Etc.

Flexible constraint specification in DbAccess

DbAccess Constrain Data Set

Columns to be Returned

- haccess,DBkey
- haccess,shot
- haccess,z0
- haccess,zvsin
- haccess,zvsout
- haccess,rxpt1
- haccess,rxpt2
- haccess,zxpt1
- haccess,zxpt2
- haccess,config
- haccess,prf
- haccess,prad

Select All

Where Clause:

haccess,shot	>=	109000	And	Or
haccess,shot	<	106000	And	Or
haccess,phase	Like	'LX'	And	Or
haccess,pnbi	Is NOT Null			

Order (Sort) Results by: (Select)

Select Cancel

Modify Constraint Clause

Add any parentheses needed for logic:

Input Field: Where haccess,shot>=109000 Or haccess,shot<106000 And haccess,phase Like 'LX' And haccess,pnbi Is NOT Null

Ok Cancel

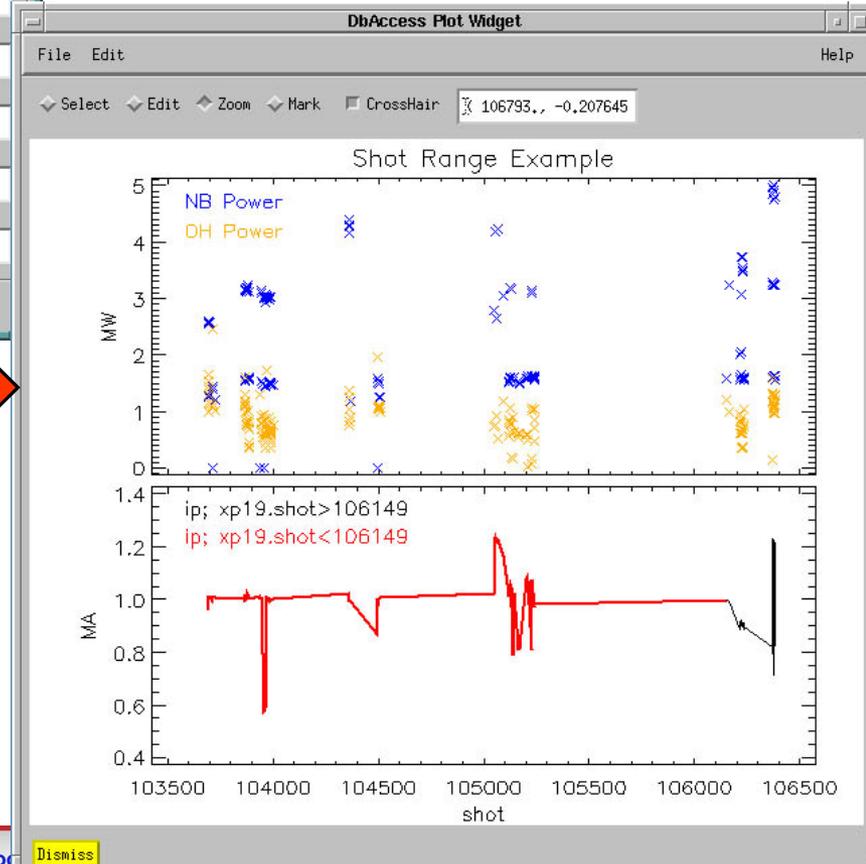
Flexible publication-quality graphics

DbAccess Plot Setup

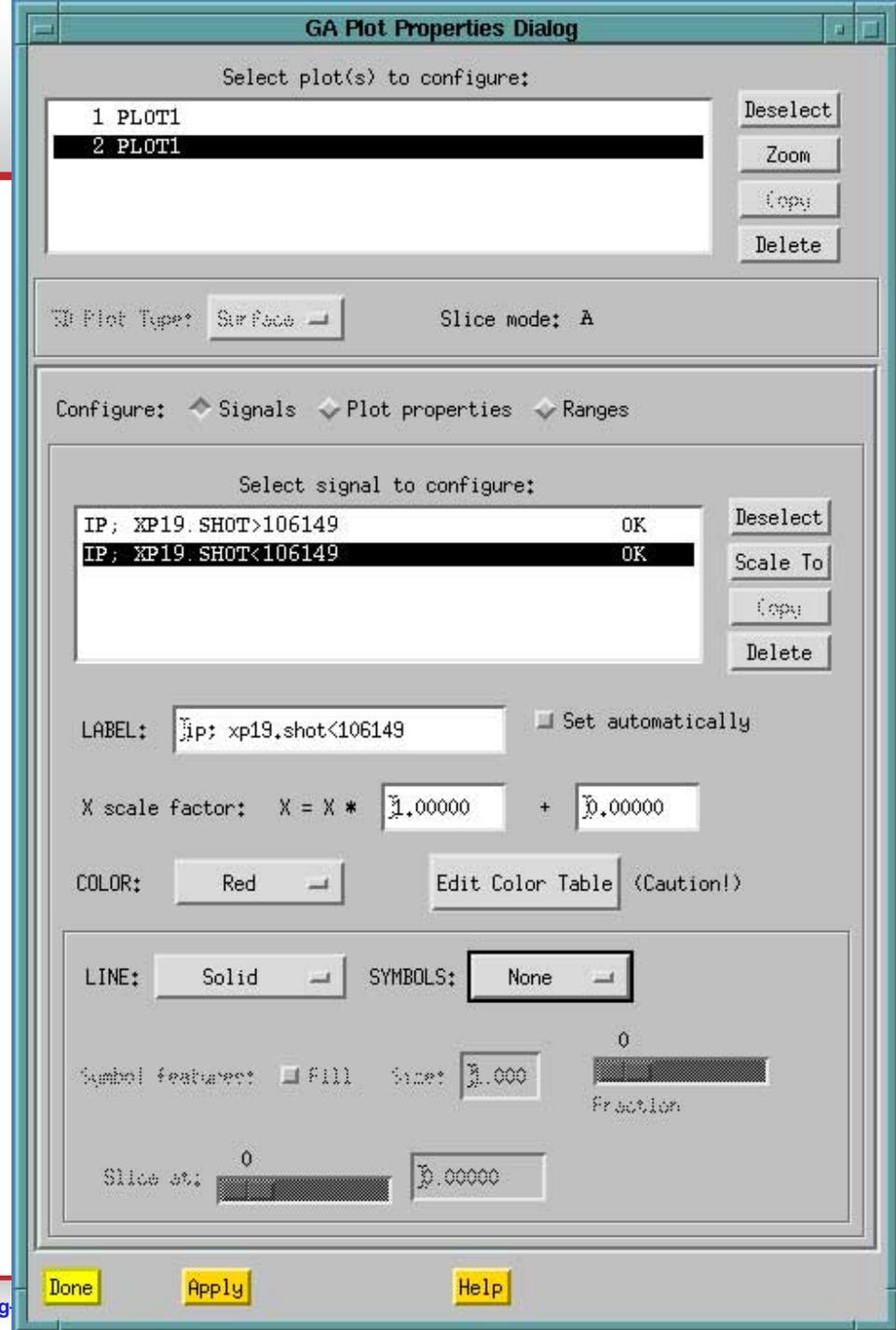
Top Plot Title:

Plot #	Axis Title	X:	Y:	Line Label	Plot Style	Constraint
1		xp19.shot	xp19.pnbi	MW	(Select)	
1		xp19.poh	xp19.poh	MW	(Select)	
2		xp19.ip	xp19.ip	MA	106149	xp19.shot
2		xp19.ip	xp19.ip	MA	106149	xp19.shot
5		(Select)	(Select)	(Select)	(Select)	(Select)
6		(Select)	(Select)	(Select)	(Select)	(Select)
7		(Select)	(Select)	(Select)	(Select)	(Select)

**Sample plot
from DbAccess**

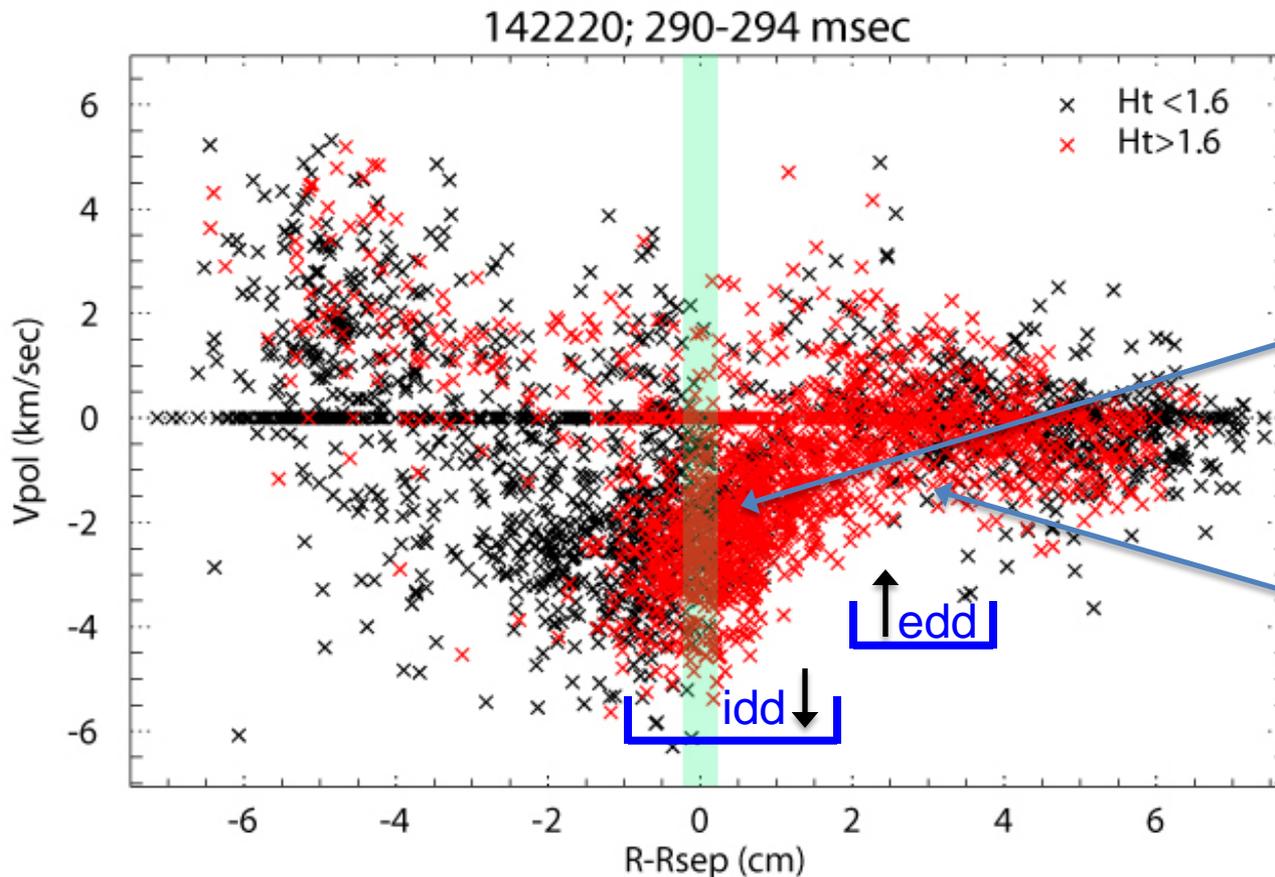


Plot Properties are configurable in DbAccess (Uses GA Plot Objects)



Example showing Poloidal velocity vs. distance from separatrix

(output from DbAccess.pro)

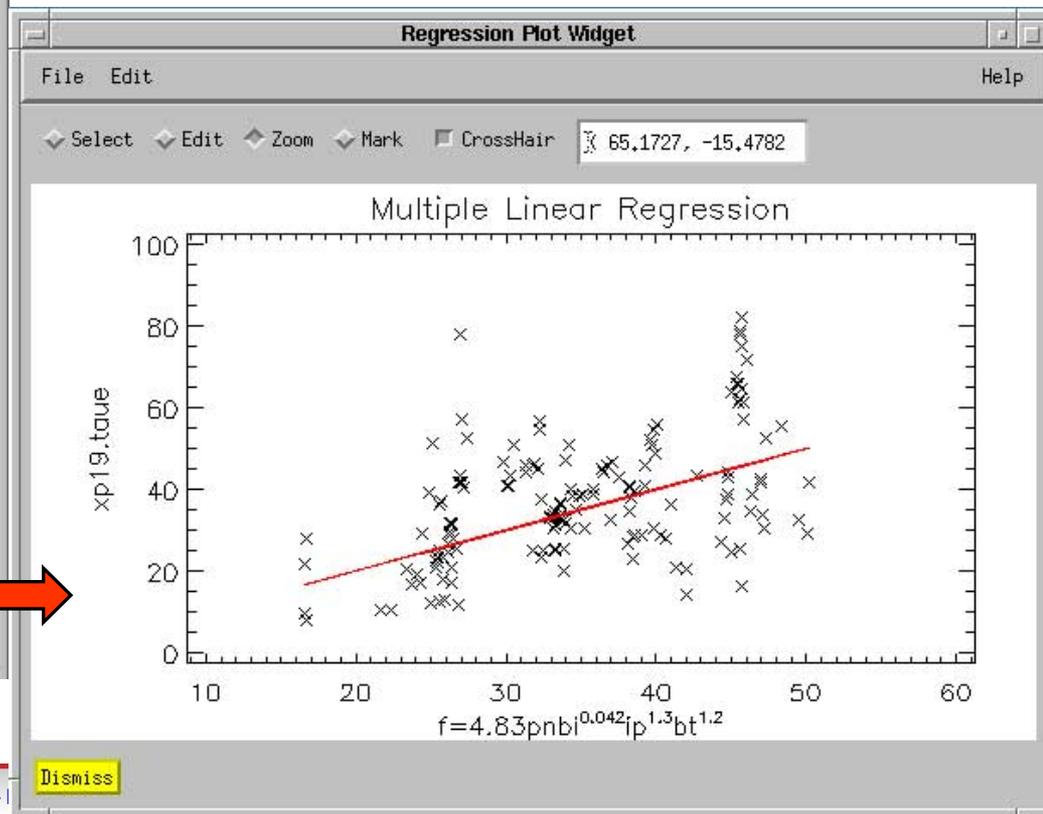


- A wide spread in poloidal velocity, even during a small time window in the same shot.
- Downward flow > -1 cm evidence of shear in this shot.
- Shear reverses between 2 & 4 cm.
- Larger blobs (red) are more likely to be ejected through the separatrix.

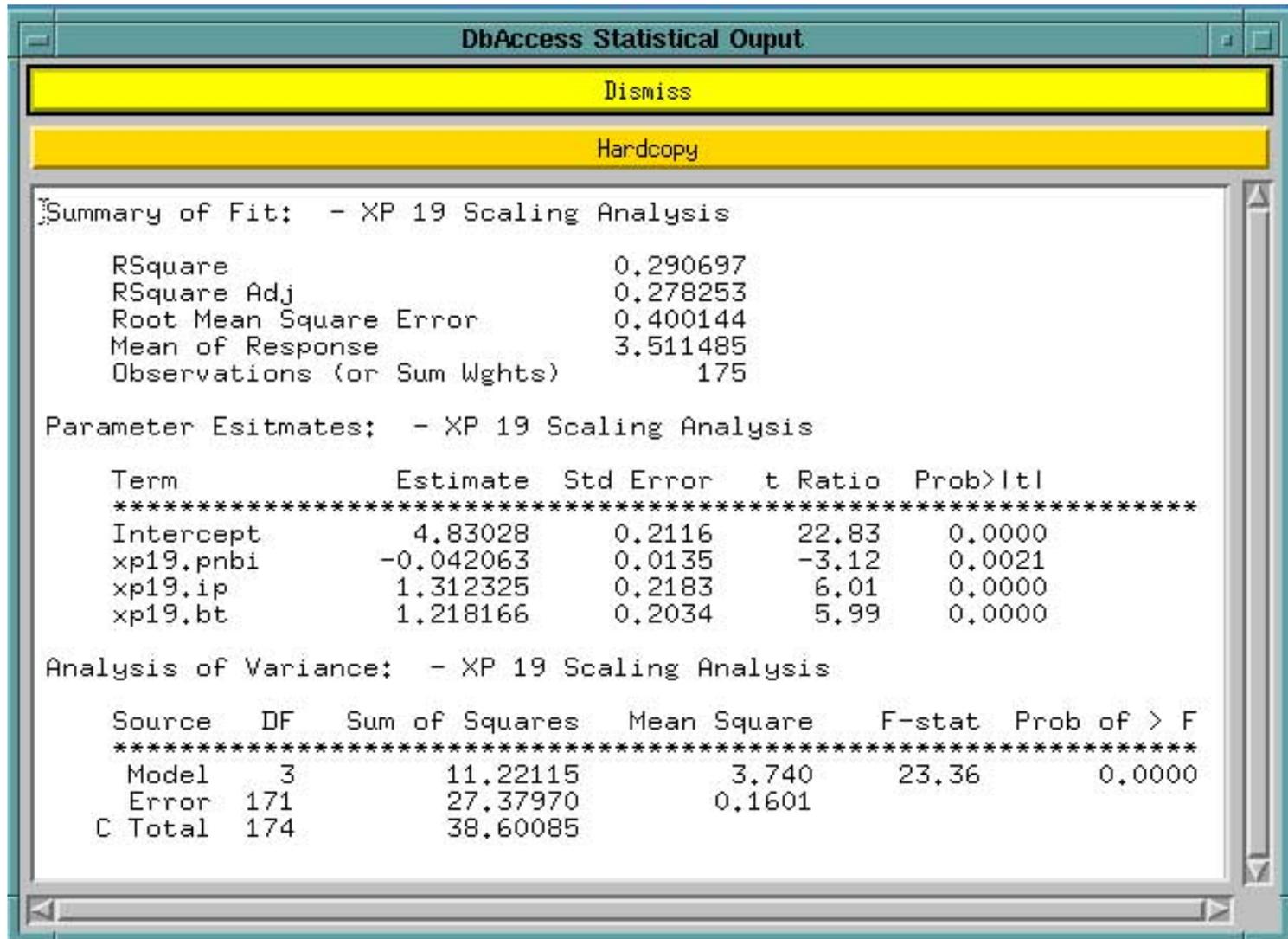
Statistical Interface in DbAccess

- Multiple Linear Regression
- Powers Optional
- Weighting Optional
- Distribution Plotting

The DbAccess Model window displays a list of variables on the left: xp19.DBkey, xp19.shot, xp19.time, xp19.phase, xp19.source, xp19.pnbi, xp19.poh, xp19.ip, xp19.bt, and xp19.q95. The variable xp19.taue is selected as the dependent variable (Y). The Weight field is currently empty. A yellow button labeled '<-Plot Distribution' is visible. Below, the 'Effects in Model' section lists xp19.pnbi, xp19.ip, and xp19.bt. A checkbox for 'Use Powers' is present. A text field for 'Comment for Hardcopy:' contains 'XP 19 Scaling Analysis'. At the bottom, there are buttons for 'Dismiss', 'Run Model', and 'Inet. of (Y-Model)'. An orange arrow points from the 'Run Model' button towards the regression plot widget.



Statistical output from DbAccess



Creating an SQL table in DbAccess

- Click on “Create Table” on the top widget
- Point, click, and describe your fields:

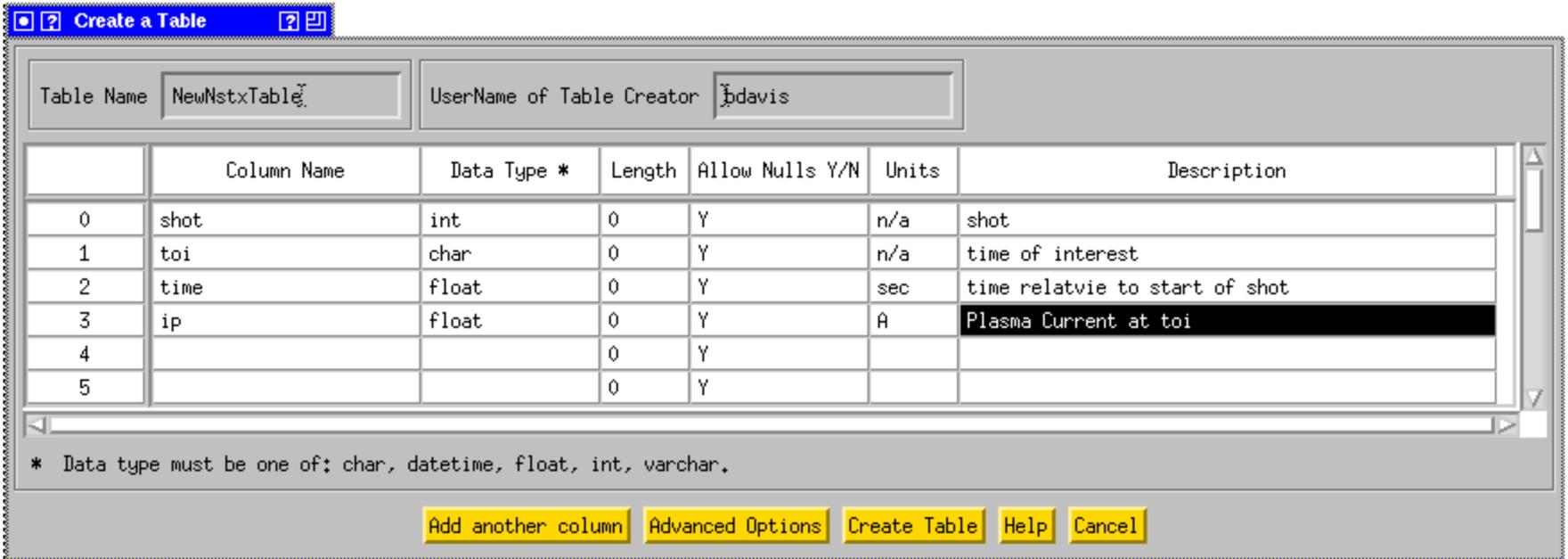


Table Name: NewNstxTable
UserName of Table Creator: jdavis

	Column Name	Data Type *	Length	Allow Nulls Y/N	Units	Description
0	shot	int	0	Y	n/a	shot
1	toi	char	0	Y	n/a	time of interest
2	time	float	0	Y	sec	time relatvie to start of shot
3	ip	float	0	Y	A	Plasma Current at toi
4			0	Y		
5			0	Y		

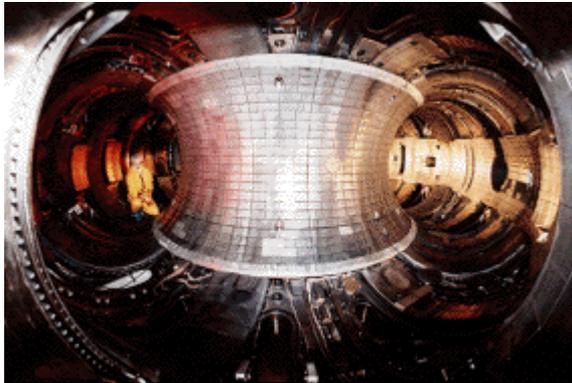
* Data type must be one of: char, datetime, float, int, varchar.

Buttons: Add another column, Advanced Options, Create Table, Help, Cancel

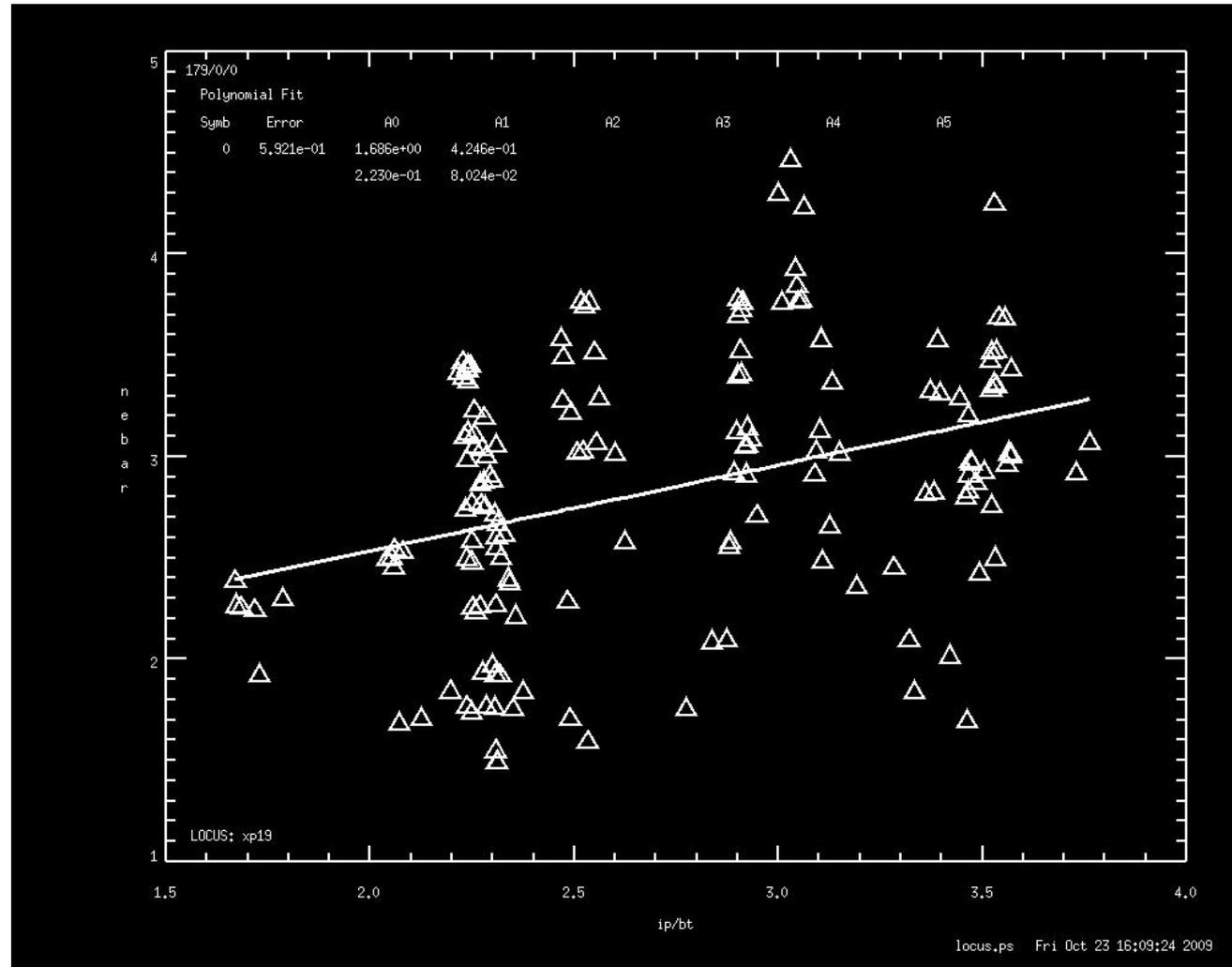
- The table can be populated from columns of data in a text file
- Other IDL code is available for creating and filling SQL tables

Locus plotting available for databases

- Locus was used extensively on TFTR



- Rewritten in IDL by Steve Scott and adapted for NSTX by Bill Davis



Instructions available at:

http://nstx.pppl.gov/nstx/Software/pdf_files/locus_users_guide.pdf

Search EFIT Database Table

<http://nstx.pppl.gov/nstx/Software/WebTools/searchefitdb.html>

Search the table in the NSTX Logbook database (NSTXLOGS).

Not all EFITs are available for all shots. See [fitsAvailable.html](#)

Optionally limit to entries in which:

betan >=	<input type="text" value="*"/>	AND	betan <	<input type="text"/>	(Normalized Beta)
betat >=	<input type="text"/>	AND	betat <	<input type="text"/>	(Toroidal Beta)
BT0 >=	<input type="text"/>	AND	BT0 <	<input type="text"/>	(Toroidal Field at Mag. Axis, 0-1)
chisq >=	<input type="text"/>	AND	chisq <	<input type="text"/>	(Magnetic Chi^2)
gapbot >=	<input type="text"/>	AND	gapbot <	<input type="text"/>	(bottom gap - m)
gapin >=	<input type="text"/>	AND	gapin <	<input type="text"/>	(inboard gap - m)
gapout >=	<input type="text"/>	AND	gapout <	<input type="text"/>	(outboard gap - m)
gaptop >=	<input type="text"/>	AND	gaptop <	<input type="text"/>	(top gap - m)
Ip >=	<input type="text" value="500000"/>	AND	Ip <	<input type="text"/>	(Plasma Current, amps)
kappa >=	<input type="text"/>	AND	kappa <	<input type="text"/>	(Elongation, 1-3)
Li >=	<input type="text"/>	AND	Li <	<input type="text"/>	(Internal Inductance)
nebar_ts >=	<input type="text"/>	AND	nebar_ts <	<input type="text"/>	(Electron Density - n/cm^3)
Pa >=	<input type="text"/>	AND	Pa <	<input type="text"/>	(NB Source A, watts)
Pb >=	<input type="text"/>	AND	Pb <	<input type="text"/>	(NB Source B, watts)
Pc >=	<input type="text"/>	AND	Pc <	<input type="text"/>	(NB Source C, watts)
Pnbi >=	<input type="text"/>	AND	Pnbi <	<input type="text"/>	(Injected NB Power, watts)
Prad >=	<input type="text"/>	AND	Prad <	<input type="text"/>	(Radiated Power - w/cm^3)
Prf >=	<input type="text"/>	AND	Prf <	<input type="text"/>	(RF Power - watts)
taumhd >=	<input type="text" value="*"/>	AND	taumhd <	<input type="text"/>	(Energy confinement time - s)
Temax >=	<input type="text" value="*"/>	AND	Temax <	<input type="text"/>	(Peak Electron Temp, eV)
tribot >=	<input type="text"/>	AND	tribot <	<input type="text"/>	(bottom triangularity, 0-1)
tritop >=	<input type="text"/>	AND	tritop <	<input type="text"/>	(top triangularity, 0-1)
wmhd >=	<input type="text"/>	AND	wmhd <	<input type="text"/>	(wtot; Total Plasma Energy - J)

(a * will return that field, but not limit the query;
if both fields are blank, that parameter won't be returned)

Time of Interest=

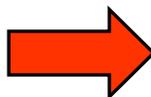
Configuration=

Limit the Search to Shots from to (Optional)

Select shot, BETAN, IP, TAUMHD, TEMAX, TOI, TIME from EFIT

where shot >= 136000 AND shot <= 137000
AND IP >= 500000 AND TOI = 'maxip' order by shot

shot	BETAN	IP	TAUMHD	TEMAX	TIME
136000	5.14471	751026	-1.71009	177.696	0.553
136001	2.06752	775327	-0.006489	0.923537	0.265
136002	3.32942	768031	0.03963	405.139	0.217
136003	3.50953	761056	0.057189	155.196	0.304
136004	1.64804	751014	-0.021714	0.99357	0.249
136005	2.43354	775475	-0.056866	0.739999	0.175
136006	3.56997	788279	-0.077491	0.741862	0.193
136007	2.76261	781949	-0.088126	1.34959	0.185
136008	1.66388	734348	-0.048584	0.728282	0.583
136009	2.65181	779994	-0.060781	0.681013	0.181
136010	2.23641	768482	-0.067917	0.672851	0.169
136011	2.46628	772562	-0.063587	0.668319	0.175
136012	2.72194	785012	-0.053308	25.7932	0.18
136013	6.4532	744939	-0.051581	345.731	0.535
136014	2.5175	776437	-0.045682	238.921	0.175
136015	1.83123	757323	-0.035338	0.695359	0.49
136016	0.99563	721911	-0.019168	0.658756	0.41
136017	1.77389	760615	-0.03144	0.836369	0.285
136018	1.85509	766116	-0.065414	0.618252	0.169
136019	1.78315	767601	0.029537	1.18659	0.304
136020	2.95963	786564	-0.065389	1.46719	0.185



Search for shots with certain criteria

<http://nstx.pppl.gov/nstx/Software/WebTools/mdsshots.html>

software

Overview Programming Diagnostics Applications
FAQ Web Tools UNIX & VMS MDSplus

Search for Shots in the NSTX MDSplus trees

(To use this page from outside the pppl.gov domain, you must be [authenticated at the firewall](#))

This page will list shots from the NSTX MDSplus Trees which meet certain criteria. You may select common parameters from the menus below, or specify your own signals. (This method is MUCH slower than using a database, such as [Searching the EFIT database.](#))

Search Shot(s)

For tips on convenient shot entry methods, see [ShotEntryHelp.html](#).
To find the shots for a certain date, [Query the NSTX Logbook](#)

(You may wish to copy and paste shots from the [NSTX XP Lists](#))

The min and max of the last signal you specify will be displayed with the shot list.

Where the **Maximum value** for Signal:

Beta Toroidal (%)	is	>	2
Plasma Current (KA)	is	>	700
(Selection Menu)	is	>	
	is	>	
	is	>	
	is	>	

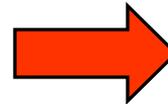
(Typed signal names must include the tree, e.g., \wf:ip
-- See the [NSTX Signals and Labels](#) page or the [MDSplus Tree Search Tool](#)).

For the Signals specified above, use a **Median-Smoothing** Neighborhood of points

Format to use for data list : (blank is default)

Shots with a Max of \EFIT01::betat GT 2
and Shots with a Max of \wf:ip GT 700

SHOT	MIN	MAX	Units
136000	-7.3507	800.045	kA
136001	-30.38	817.384	kA
136002	-27.772	853.651	kA
136003	-28.058	839.946	kA
136004	-32.09	819.479	kA
136005	-31.119	826.311	kA
136006	-31.303	808.516	kA
136007	-32.047	813.431	kA
136008	-27.533	825.746	kA
136009	-29.964	811.417	kA
136010	-32.703	810.815	kA
136011	-30.77	817.195	kA
136012	-32.254	807.92	kA
136013	-27.453	809.922	kA
136014	-26.624	806.96	kA
136015	-28.935	825.323	kA
136016	-31.572	846.212	kA
136017	-28.491	816.568	kA
136018	-30.761	805.05	kA
136019	-24.551	844.514	kA
136020	-28.067	813.223	kA



Search the NSTX Logbook

<http://nstx.pppl.gov/nstx/Software/WebTools/weblogplus.html>

Search/view the NSTX Logbook with Plot Summaries

This page will search the ENTRIES table in the NSTX Logbook database (NSTXLOGS).

(for output in table form, see [searchlogbookcomments.html](#); For a simpler version of this page, see [logbook.html](#).)

Optionally limit to entries where the **comments** contain the strings (blanks are OK):

AND AND

(NOT case sensitive)

Optionally limit to:

username= (e.g., KAYE; blank returns all users)

Include all entries with TOPIC='PHS OPS', 'SESSION LEADER', or 'RF'.

xp= (e.g., 5; blank returns all)

topics to display: **ALL:** (if checked, ignores boxes below)

BOLOMETRY: **BOUNDARY PHYSICS:** **CHI:**

CONDITIONING: **EFIT:** **ENGINEERING:** **FIDA:**

HYBRID: **IMPURITIES:** **MAGNETICS:** **MHD:**

MPTS: **MSE:** **PHYS OPS:** **RF:** **SESSION LEADER:**

Limit the Search to **Shots** from to (Optional) Also see [ShotEntryHelp.html](#)

Limit the Search to **Rundate** (yyyymmdd) (Optional) e.g., 20080229; **0=today**

(defaults to all of the most recent day with an entry)

Suppress plot thumbnails

(Output will appear in a separate window entitled "Search Results from the NSTX Logbook")



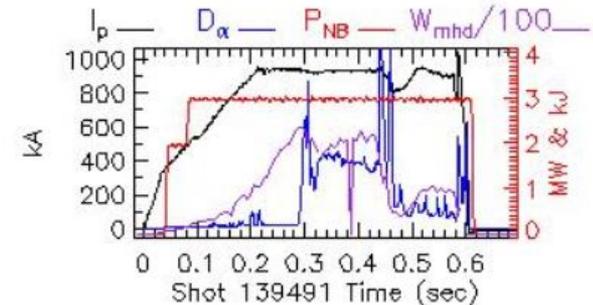
Output from Searching the NSTX Logbook

139491 XP# 1045 SESSION LEADER Aug 03 2010 01:59PM ekolemen

Problem with the reproduction of the x-point shot from friday.

Try to reload 137983.

OK but the beams were not the same. Ends at 450 ms.



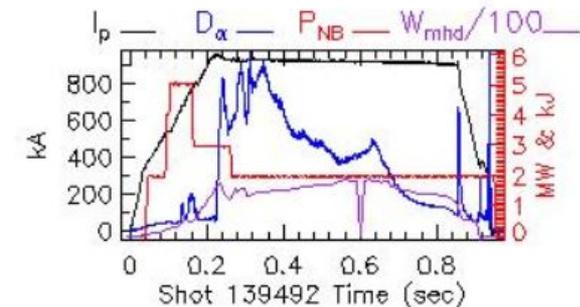
139491 XP# 1045 SESSION LEADER Aug 03 2010 02:00PM VLAD

Try loadin 137983, another SP-controlled shot.

Result: better, but still short.

139492 XP# 1045 SESSION LEADER Aug 03 2010 02:00PM ekolemen

Reload the same beams. Good match. We can start the XP.



139492 XP# 1045 SESSION LEADER Aug 03 2010 02:01PM VLAD

Repeat previous shot, with NBI from 137983.

Better.

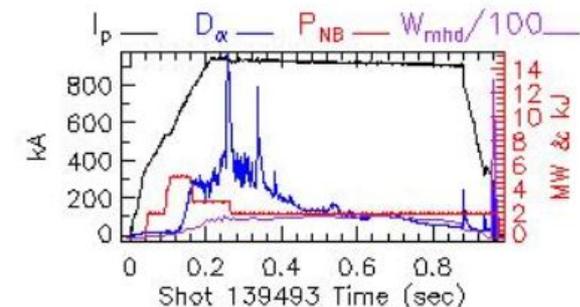
139492 XP# 1058 BOLOMETRY Aug 03 2010 02:15PM spaul

Very high Prad with peaked profile, collapsing at .65 sec Prad on wings rises

forming a hollow profile with edge power density exceeding .2 MW/m³. Total Prad about 1.5 MW and Te decreases after .6 sec.

139493 XP# 1045 SESSION LEADER Aug 03 2010 02:04PM ekolemen

Move the strik point inwards by 3 cm from 250 to 350 ms to 47 cm.



Combw.pro (from Eric F.)

IDL> combw

Comb Widget

Shot: 117648

SYSTEM: X-Ray Mirnov

Array: hcp hdown vtop

Array: Center Stack Poloidal Toroidal hf

Digitizer Type: S12 S3 hn hf

0 4 8 12

Channel: 1 5 9 13

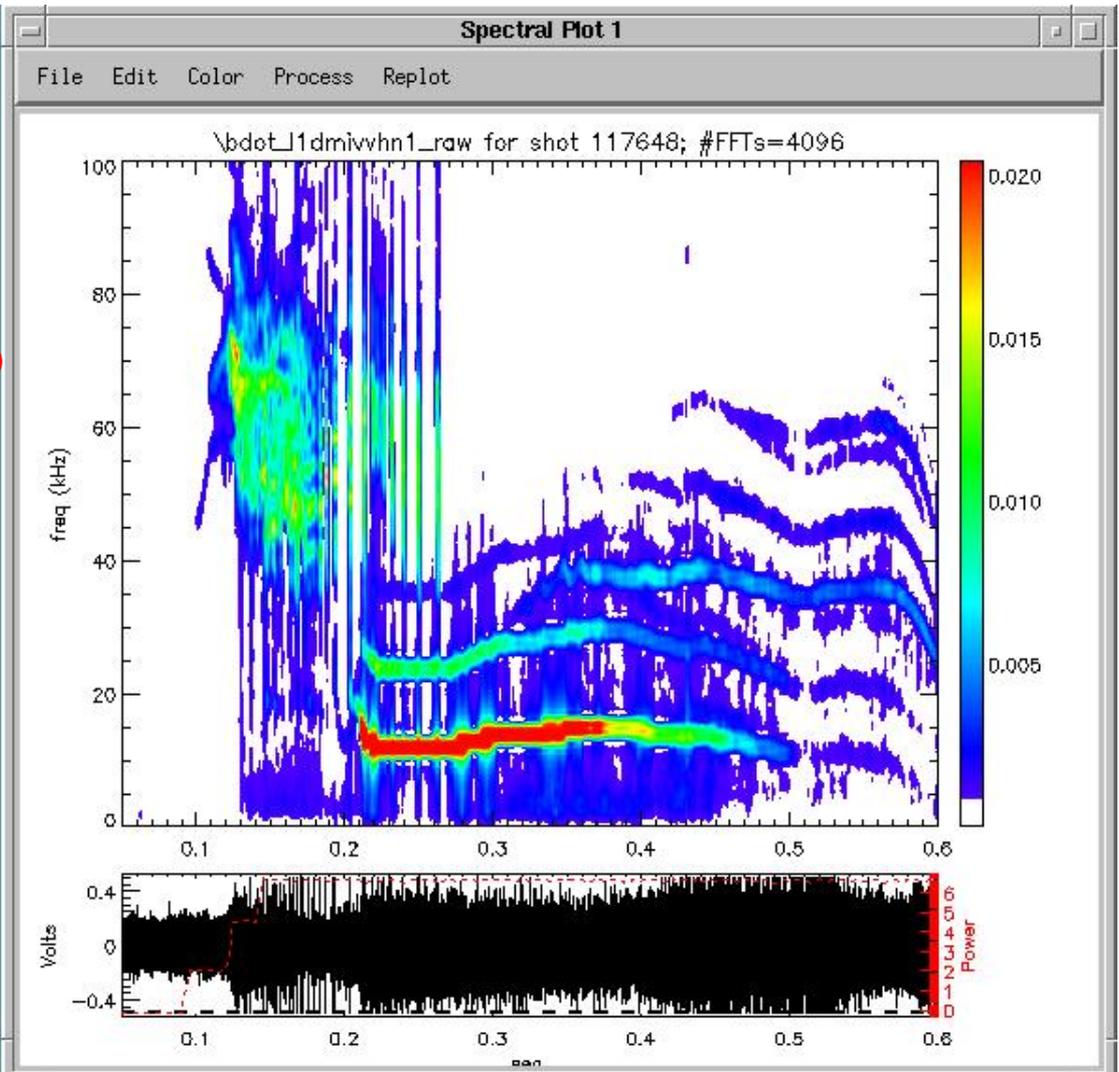
2 6 10 14

3 7 11 15

of FFT points: 4096

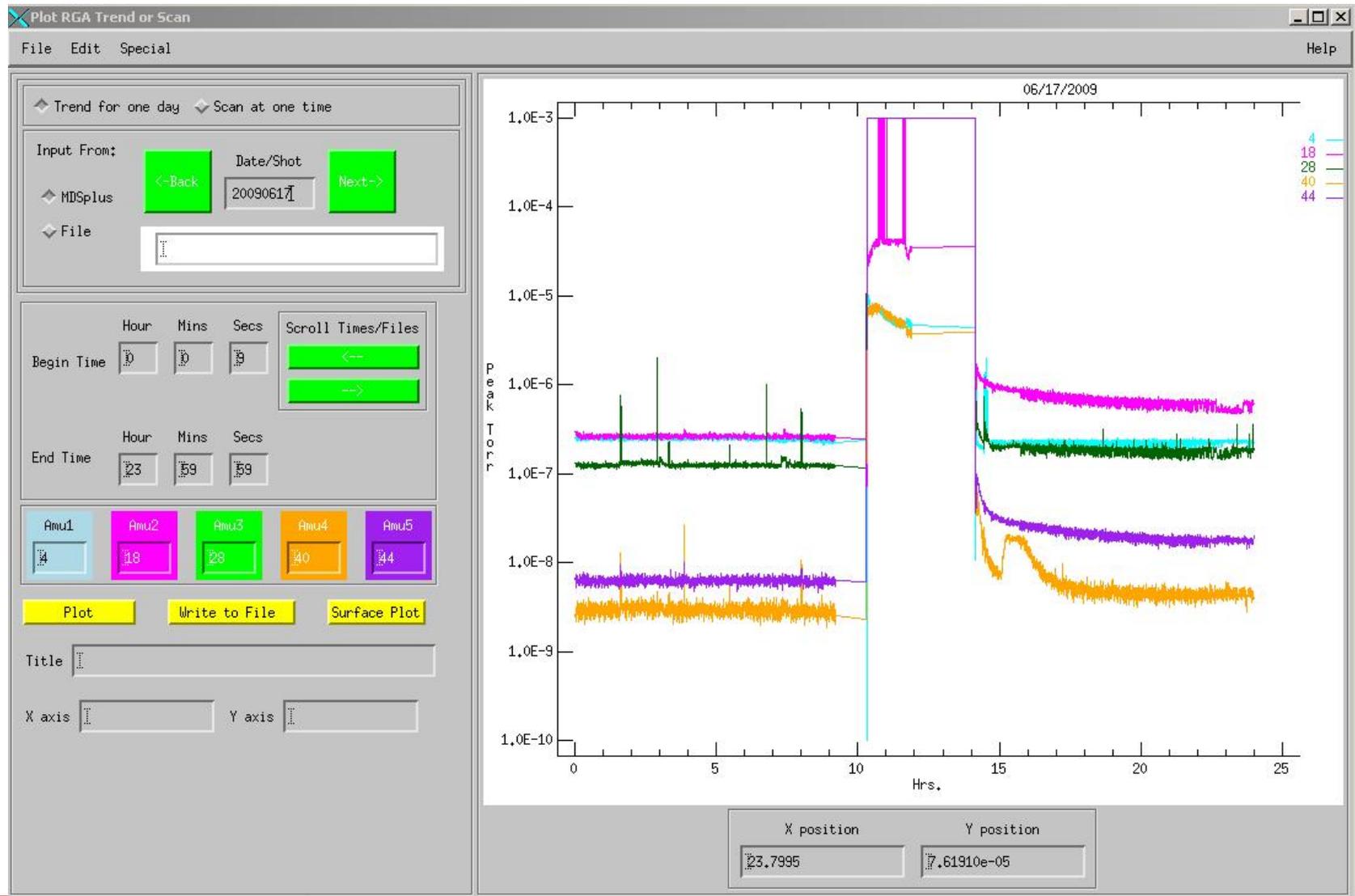
Window Size: X: 800 Y: 640

Plot 1 Plot 2 # of smooth pts: 3



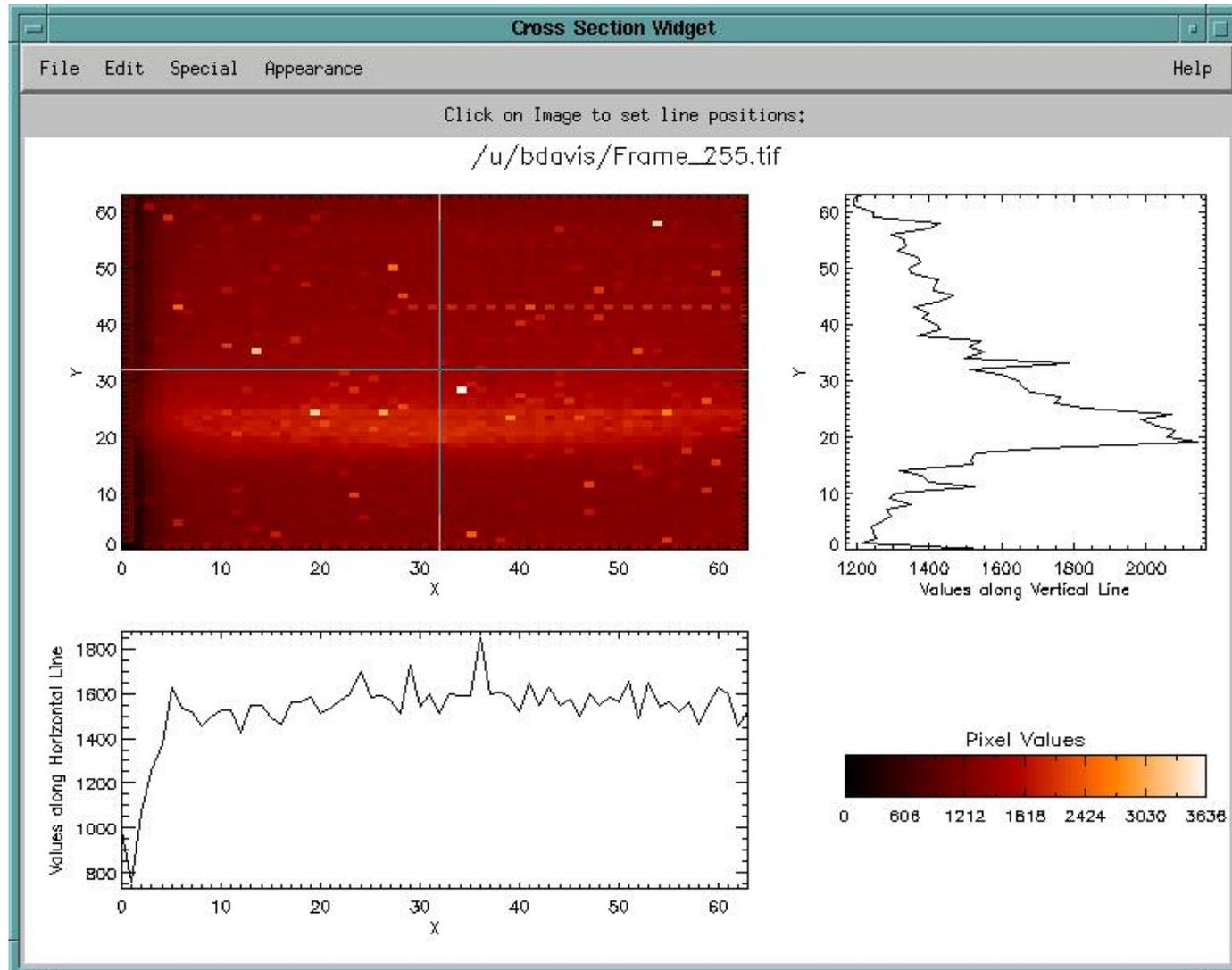
RGA data can be plotted as trends

IDL> rgaplot



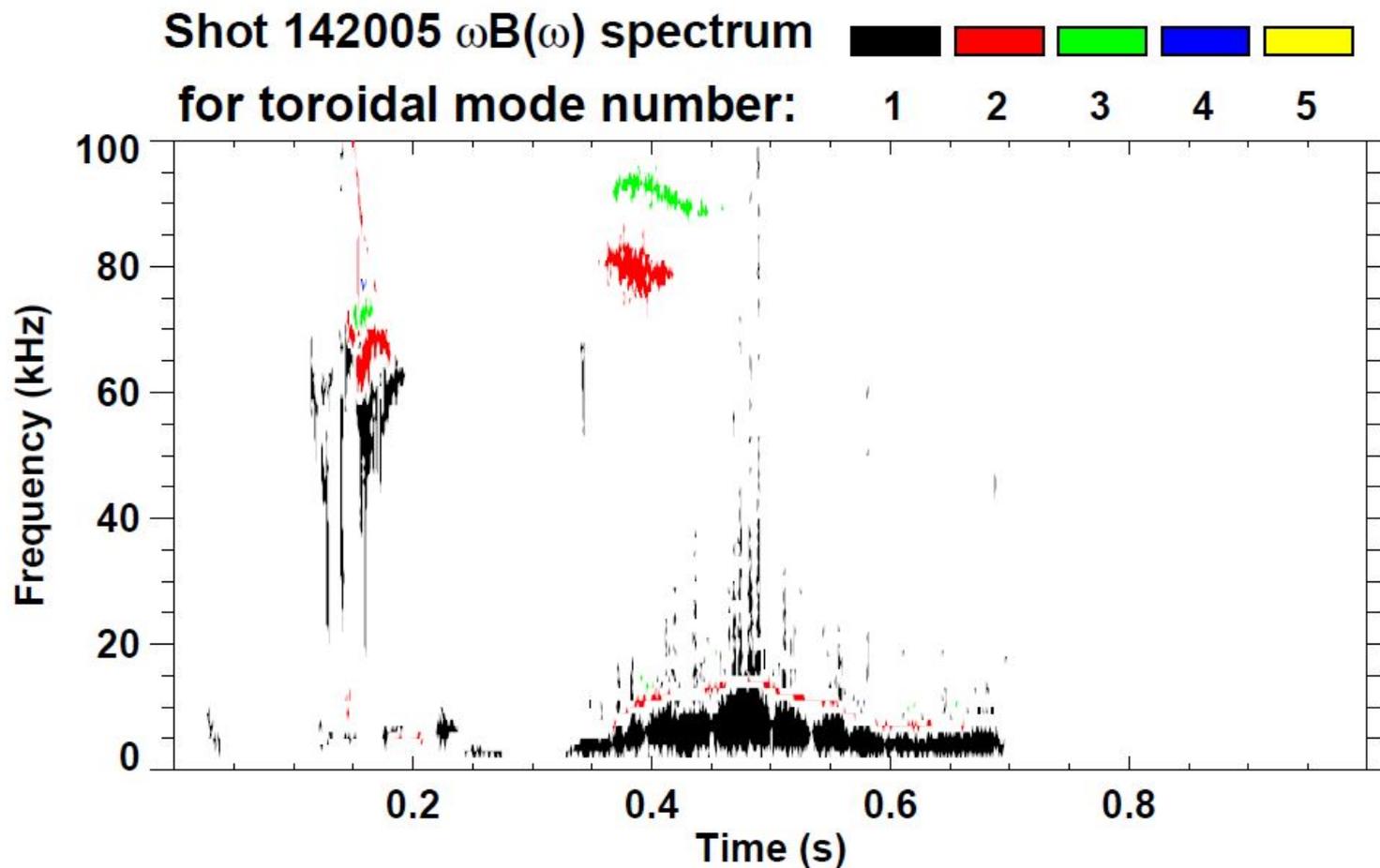
Xsectionw.pro shows cross sections of images

IDL> xsectionw, 'Frame_255.tif'



Toriodal Mode Numbers browsable from web

<http://nstx.pppl.gov/nstx/Software/Diagnostics/SpecFit/...>



(instructions on the web page for creating plots with different axes in IDL)

Summary

- Web Tools have many features and options with intuitive interfaces
 - Tools available for “mining” the large amount of NSTX camera data
 - Databases seem underutilized on NSTX, but tools are available and can be supported
 - It is easy to search for shots with certain characteristics
 - There are various ways of visualizing data that could be explored to get more from your data
- What new data analysis and visualization tools do we want for NSTX-U?

