

Facilitating H1 data access for collaborators

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The H1 data system upgrade

Part of the \$7m upgrade to the Australian Plasma Fusion Research Facility

Scope:

- Simple interface for new users and collaborators
- Extensible summary database
- Centralised documentation and metadata.
- Support for: Web browsers, IDL, Python, Matlab, etc...

At present, focus is on web interface to MDSplus

http://h1ds.anu.edu.au/mdsplus/H1DATA/58063/TOP/OPERATIONS/MIRNOV/A14_14/INPUT_2/

H1 Data Server

[MDSPlus](#) · [Summary](#) · [Configurations](#) · [Wiki](#) · [Activity](#) · [Code](#)

shot

children

members

ENDIDX	STARTIDX
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tags

TOP	FOOBAR
COMMENT	I_RING_0
I_MAIN	MASS_EFF
K_OVF	PUFF_V
PUFF	W_PERP
SVD	ZMM_AMPLITUDE
TOP	TOP
N_E	TOP

trees

imax	fluctuations
spectroscopy	h1data
electr_dens	

path \H1DATA::TOP.OPERATIONS.MIRNOV:A14_14:INPUT_2

data

views bin xml json html csv png

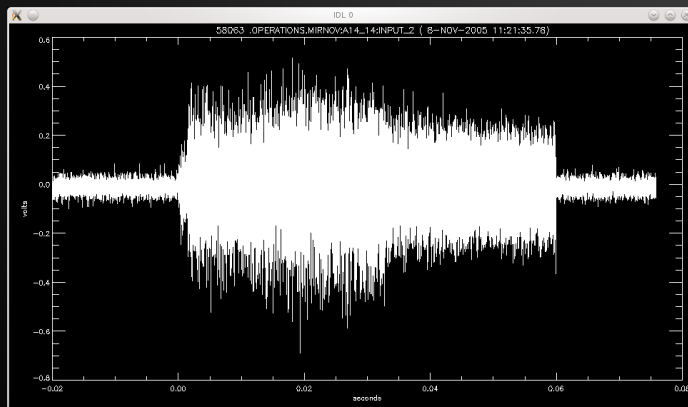
filters

resample	<input type="text" value="max_sai"/>	<input type="button" value="+"/>	
resample_minmax	<input type="text" value="n_bins"/>	<input type="button" value="+"/>	
dim_range	<input type="text" value="min_val"/>	<input type="text" value="max_val"/>	<input type="button" value="+"/>
norm_dim_range	<input type="text" value="min_val"/>	<input type="text" value="max_val"/>	<input type="button" value="+"/>
mean		<input type="button" value="+"/>	
max_val		<input type="button" value="+"/>	
dim_of_max_val		<input type="button" value="+"/>	
element	<input type="text" value="index"/>	<input type="button" value="+"/>	
multiply	<input type="text" value="factor"/>	<input type="button" value="+"/>	
divide	<input type="text" value="factor"/>	<input type="button" value="+"/>	
peak_to_peak		<input type="button" value="+"/>	
prl_lpn	<input type="text" value="f0"/>	<input type="text" value="order"/>	<input type="button" value="+"/>
subtract	<input type="text" value="value"/>	<input type="button" value="+"/>	
add	<input type="text" value="value"/>	<input type="button" value="+"/>	
max_of	<input type="text" value="value"/>	<input type="button" value="+"/>	
first_pulse	<input type="text" value="thresho"/>	<input type="button" value="+"/>	

Client libraries

- So far, IDL and Python have been written. More coming.
- Can simply paste URL into client library, or use standard MDSplus path syntax.
- Quantised signal data is transmitted over network as optimally compressed binary (reduce bandwidth and latency)
- HTTP, XML etc libraries come standard with most languages, so client libraries are actually quite simple, e.g. python ~ 100 lines of code.
- Code: <https://code.h1svr.anu.edu.au/projects/h1ds-client>

```
IDL> data_from_mds, mydata, 'h1data', '.operations.mirnov:a14_14:input_2', 58063  
IDL> mydata->plot
```



Summary database

http://h1ds.anu.edu.au/summary/72500-72510/i_ring+kappa_h+kappa_v+recorded+ne18_bmax/

[log in](#)

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shot	i_ring	×	kappa_h	×	kappa_v	×	recorded	×	ne18_bmax	×
72510	6490.846		1.0		1.0		May 27, 2011, 4:04 p.m.		0.289398193359	
72509	6489.9345		1.0		1.0		May 27, 2011, 4:03 p.m.		0.293803840876	
72508	-7.60784228516		1.0		1.0		May 27, 2011, 4:02 p.m.		0.00276172626764	
72507	6487.463		0.5		1.0		May 27, 2011, 3:51 p.m.		1.78734374046	
72506	6488.0745		0.5		1.0		May 27, 2011, 3:50 p.m.		1.82621097565	
72505	6489.9825		0.5		1.0		May 27, 2011, 3:45 p.m.		1.40175783634	
72504	6489.2865		0.48		1.0		May 27, 2011, 3:44 p.m.		1.49578130245	
72503	6488.8665		0.46		1.0		May 27, 2011, 3:43 p.m.		1.58237504959	
72502	6488.9985		0.44		1.0		May 27, 2011, 3:42 p.m.		1.626953125	
72501	6488.5065		0.42		1.0		May 27, 2011, 3:40 p.m.		1.60201561451	
72500	6489.8865		0.4		1.0		May 27, 2011, 3:39 p.m.		1.50925004482	

show attributes	
tt_sec	rga_imax
th_main	la_slit
ech_ib	gas1_M
mains	mag_fl1
rfptop	wg_bolo
th_sec	v_main
v_sec	HDB_del
im1	gas3_flow
is2	is1
mains_droop	rf_drive
t_mid	gas1_Z
ech_vb	gas3_z
p_iong	rftune2
i_f_sl	gas2_flow
la_int	puff_v
rf_peak	is3
t_snap	dia_var
gas2_z	tt_main
b_p6	ech_est
ech_pulse	rftune1
mag_flg	rftune4
im3	im2
i_f_pk	HDB_num
HDB_wid	la_trim
i_main	i_sec
i_fault	i_top
i_bot	ne18_bar
w_dia	rf_power
kappa_i	lcu_gas_1_flow
lcu_gas_2_flow	lcu_gas_3_flow
lcu_gas_4_flow	lcu_gas_5_flow
shunt_kh	

[hide attributes](#)

Wiki: H1 documentation and operations log

<http://h1ds.anu.edu.au/wiki/>

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H1 Log

H1 operations log. Pages are named Day/YYYY/MM/DD (e.g. Day/2009/01/01)

- [H1 log overview](#)
- [Latest shot](#)

H1 Diagnostics

Documentation for diagnostics currently installed or planned.

- [Installed Diagnostics](#)
- [Operational Diagnostics Upgrade](#)

Data systems

An upgrade of the H1 data system (H1DS) is being implemented as part of the H1 infrastructure upgrade.

- [Summary database](#)
- [Web interface to MDSPlus](#)

H1 Vacuum System

Documentation related to the vacuum system, including upgrades and planned at-atmosphere work.

- [Vacuum port list](#)
- [Upgrade work](#)

MDF

The Materials Diagnostic Development Facility (MDF) under construction will allow development of diagnostics for fusion plasma-material interactions, and to a limited extent, the testing of materials under high heat and plasma flux.

- [MDF Overview](#)
- [MDF Power Systems](#)

Links

- [IT Documentation \(printers, calendars, etc\)](#)
- [Internal information for PRL staff and students](#)
- [H1-related Theses](#)

Configuration database

A database of commonly used H1 magnetic configurations has been generated and is accessible on the web.

Entries include:

- profile data (rotational transform, magnetic well)
- Poincare plots for several cross sections
- Vacuum field models (Bline and HELIAC codes)
- VMEC input files and Boozer coordinates

For example, see the standard configuration entry is here: <http://h1ds.anu.edu.au/configurations/kh0.00/>

Collaborative & distributed code development

<https://code.h1svr.anu.edu.au/projects/h1ds>

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Overview

H1 Data system: main customisable project module.

Read-only access:
git clone git://code.h1svr.anu.edu.au/h1ds/h1ds.git

- Subprojects: django-openid-auth, h1ds_client, h1ds_configdb, h1ds_core, h1ds_mdspplus, h1ds_summary

Issue tracking

- Bug: 11 open / 24
- Feature: 19 open / 30
- Support: 0 open / 0

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