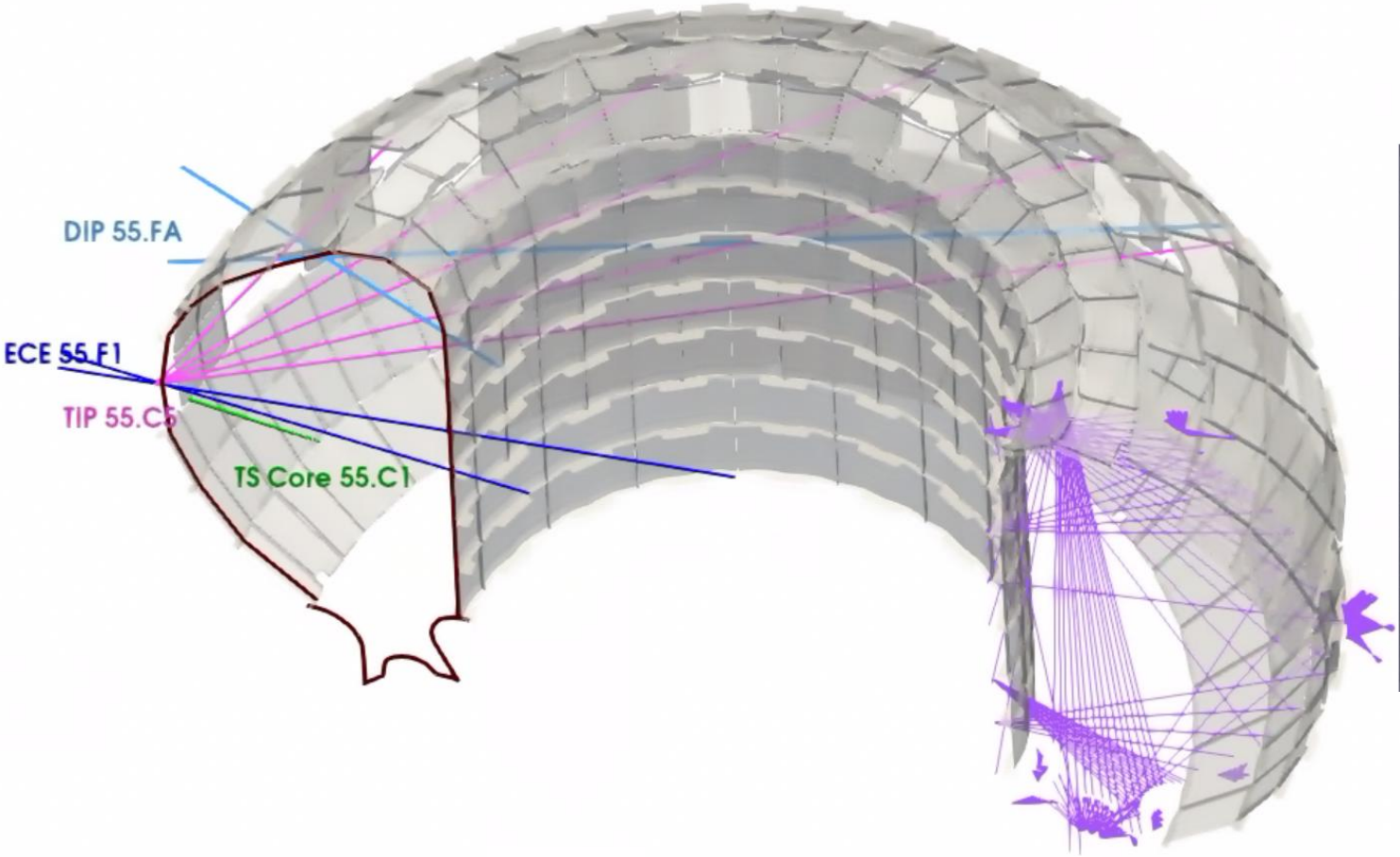

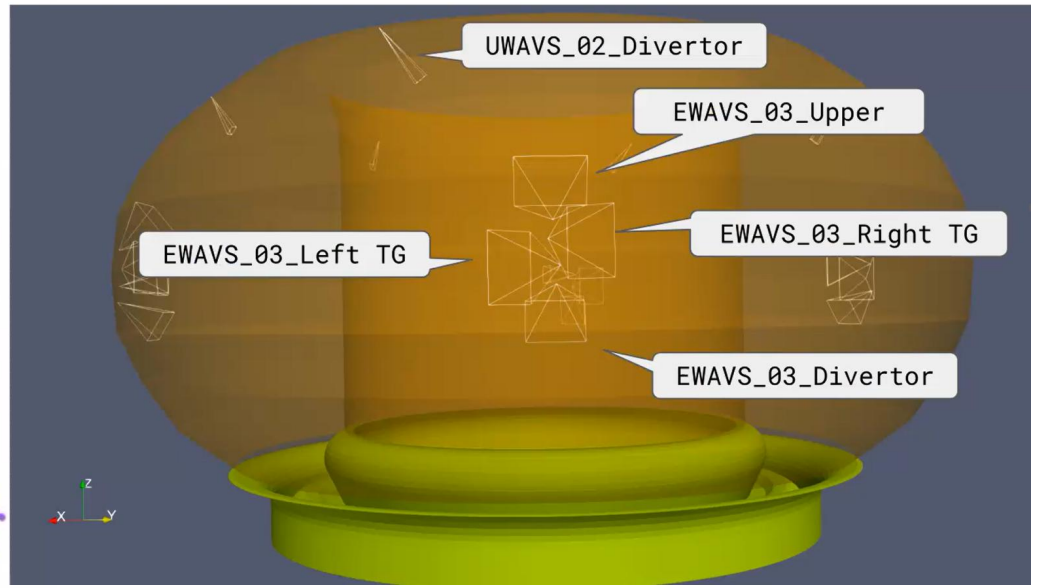

IMAS Visualization Tools

Paulo Abreu, ITER Organization
EUROfusion DSO Science Meeting
November 4th 2026

iter
china eu india japan korea russia usa

Disclaimer: The views and opinions expressed herein do not necessarily reflect those of the ITER Organization

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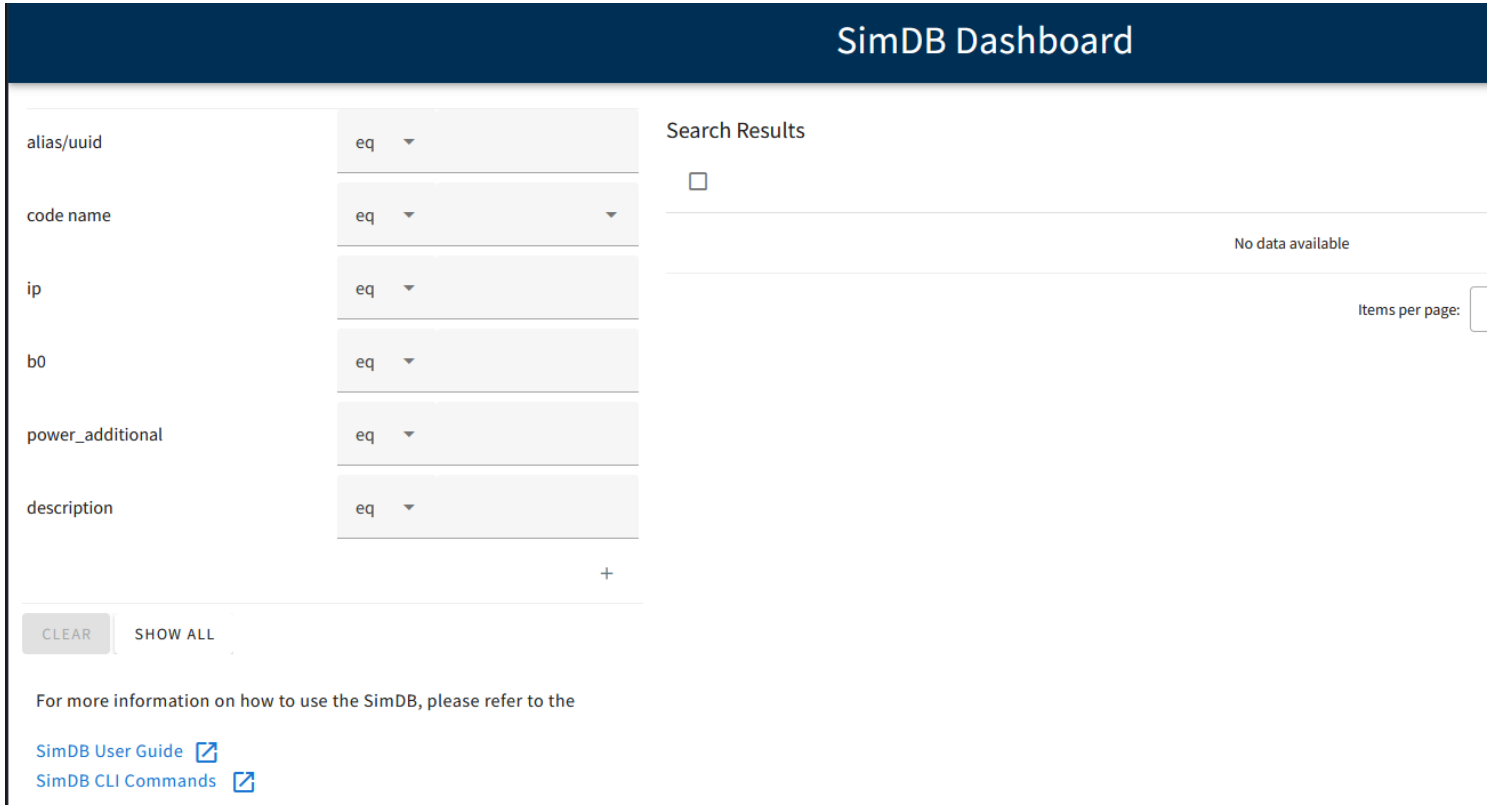
Scenario exploration with SimDB Dashboard

- The IMAS **Scenario Database** contains over one thousand scenarios
- There is a reduced list of recommended scenarios for the main operational points of the ITER Research Plan
- It contains scenarios dedicated to **H&CD studies and Diagnostic Development**
- Both for the **current/new baseline** and the old baseline
- Continuously updated, **including requests from the SD developers**
- **SimDB:** exploration of available scenarios (simdb.iter.org)



Scenarios for SD studies

- The IMAS **Scenario Database** contains over one thousand scenarios
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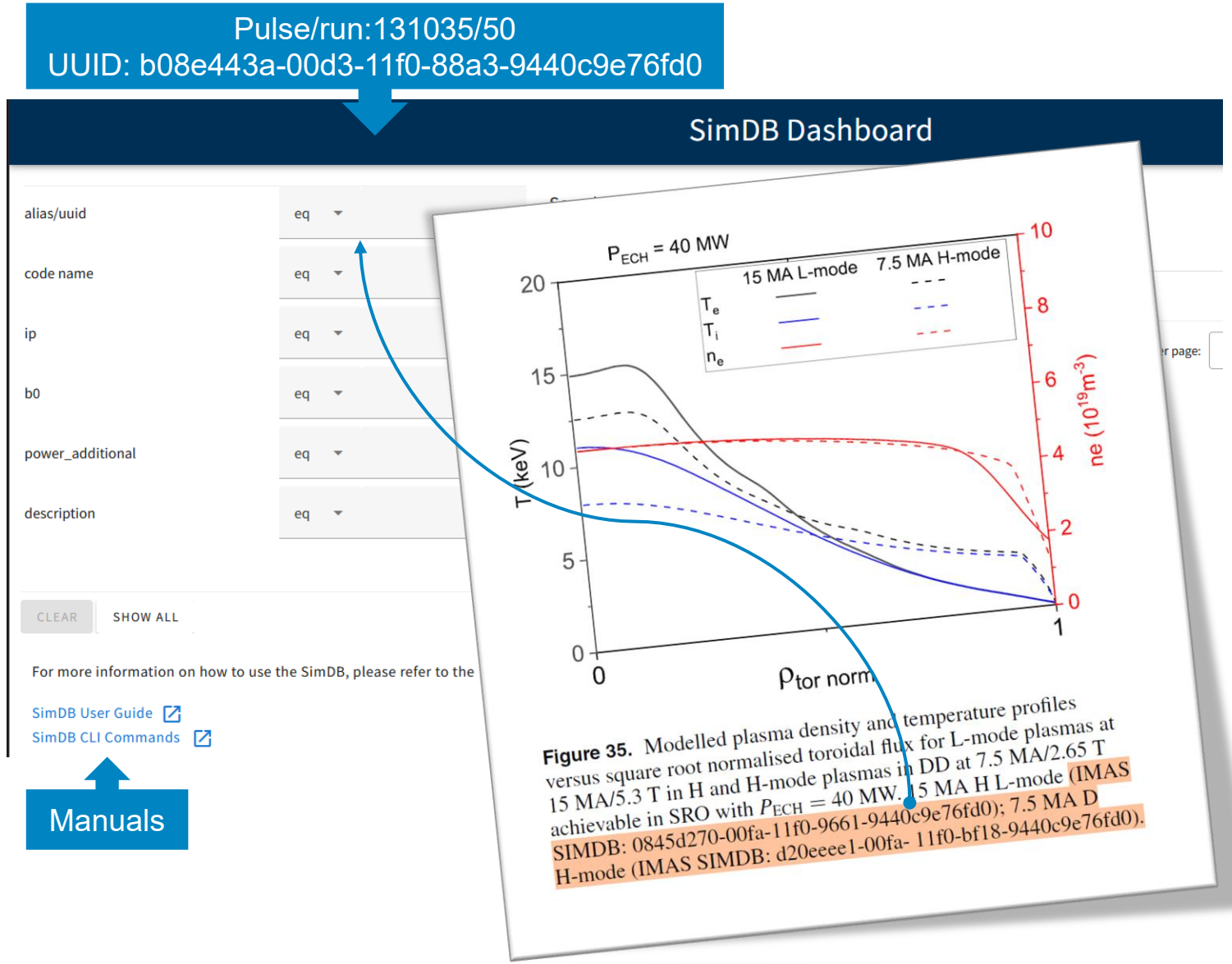
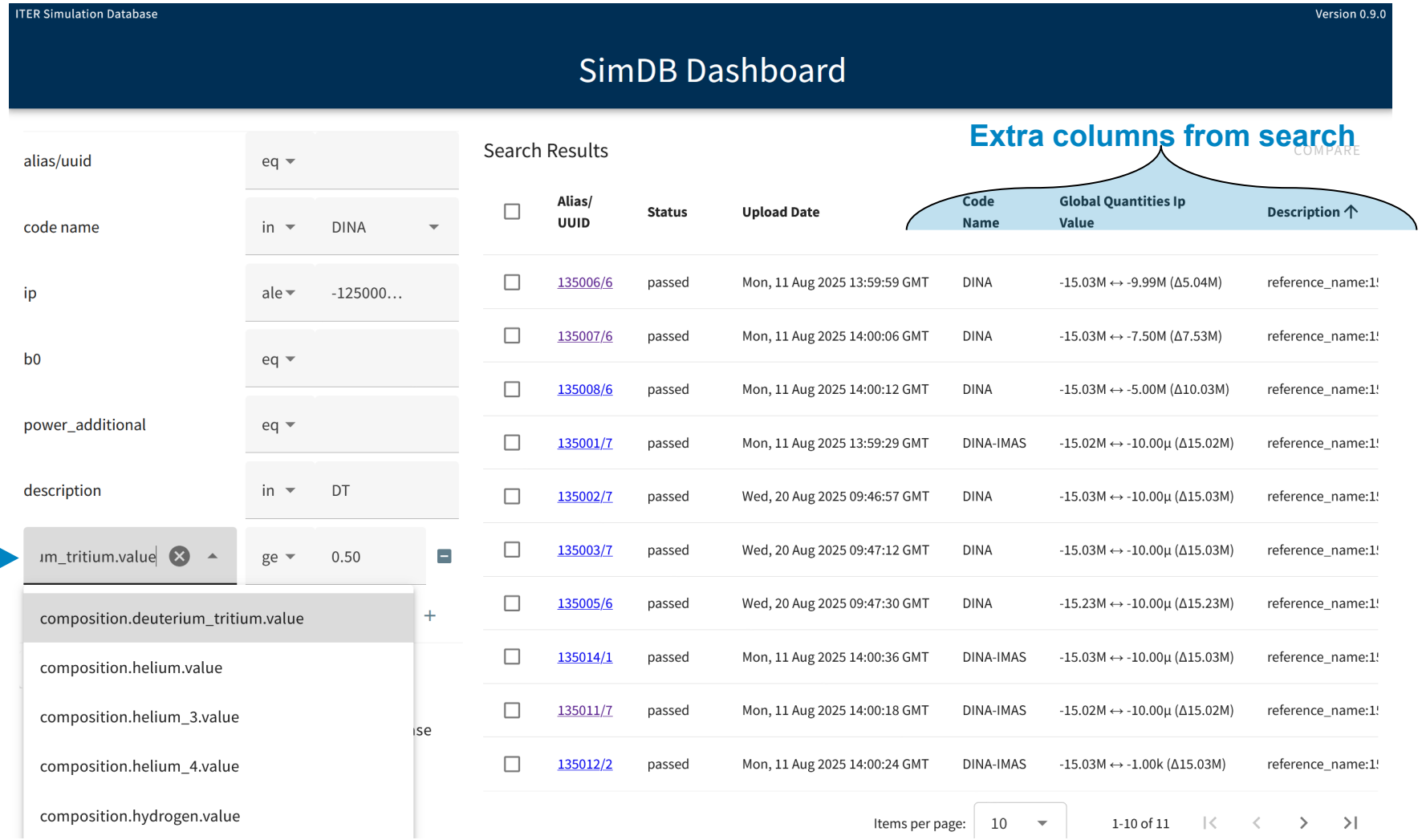


Search example: Ip>12.5MA, D-T>50%, DINA



Added from summary IDS

Search example: Ip>12.5MA, D-T>50%

ITER Simulation Database

Sim

alias/uuid	eq	
code name	in	DINA
ip	ale	-125000…
b0	eq	
power_additional	eq	
description	in	DT
ım_tritium.value	ge	0.50

composition.deuterium_tritium.value
composition.helium.value
composition.helium_3.value
composition.helium_4.value
composition.hydrogen.value

Added from summary IDS

Search Results

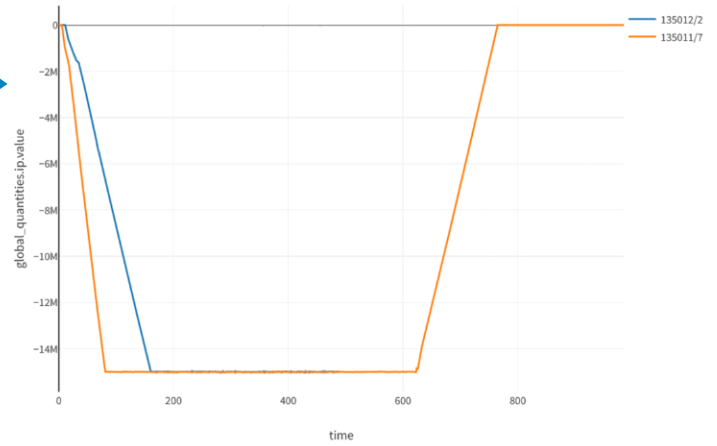
Alias/ UUID
135006/6
135007/6
135008/6
135001/7
135002/7
135003/7
135005/6
135014/1
135011/7
135012/2

SimDB Dashboard

Description	SOB: 100s (500MW) End of simulation: t=230s, -15MA Comments: Modification of the baseline 15MA scenario with the revised plasma start-up and XPF at 5MA during ramp up. Only beginning of the scenario is presented. The remainder of the scenario supposed to be as in shot=135011 IDM link to ZIP folder: https://user.iter.org/?uid=48S3YH&action=get_document Report: https://user.iter.org/?uid=4AD493&action=get_documentscenario_key_parameters: confinement_regime: H-mode magnetic_field: -5.3 main_species: DT plasma_current: -15.03 volume_average_electron_density: 1.11e+20 volume_average_zeff: 1.29 hcd: p_hcd: 53.0 p_ec: 20.0 p_ic: 0.0 p_nbi: 33.0 p_lh: 0.0 characteristics: type: Predictive workflow: DINA-IMAS machine: ITER plasma_composition:DT(0.910),He(0.027)	H to L transition: 598s (-15MA) Last divertor config.: 661s, -1.5MA EOP: 661s, -1.5MA Comments: Baseline 15MA scenario with the limits on the vertical forces acting on the CS maxB(PF6) = 5.9T (Ip rampup during 65s), Ip RMS(dZ/dt)=0.6m/s, Pfus= 500MW IDM link to ZIP folder: https://user.iter.org/? Report: https://user.iter.org/?uid=3T4JWP& confinement_regime: H-mode magnetic_field: -5.3 main_species: DT plasma_current: -15.03 volume_average_electron_density: 1.11e+ volume_average_zeff: 1.29 hcd: p_hcd: 53.0 p_ec: 20.0 p_ic: 0.0 p_nbi: 33.0 p_lh: 0.0 characteristics: type: Predictive workflow: DINA-IMAS machine: ITER plasma_composition:DT(0.910),He(0.027)
status	passed	passed
Creation Date	2022-01-21 15:08:11	2021-12-15 22:47:13

Select, compare, plot, export

Global Quantities Ip Value

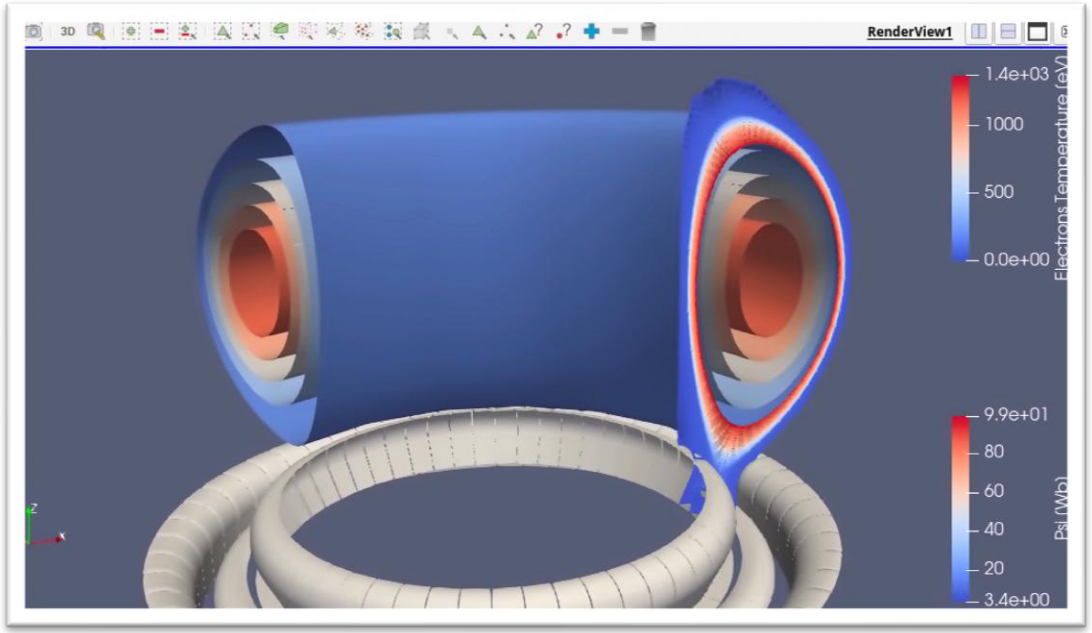


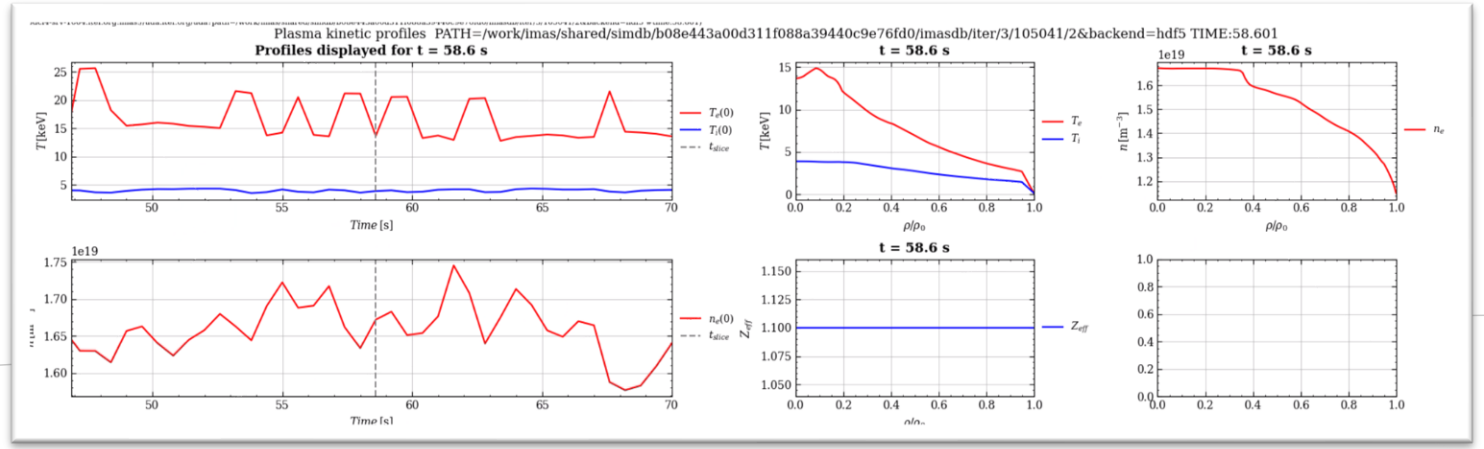
DOWNLOAD DATA

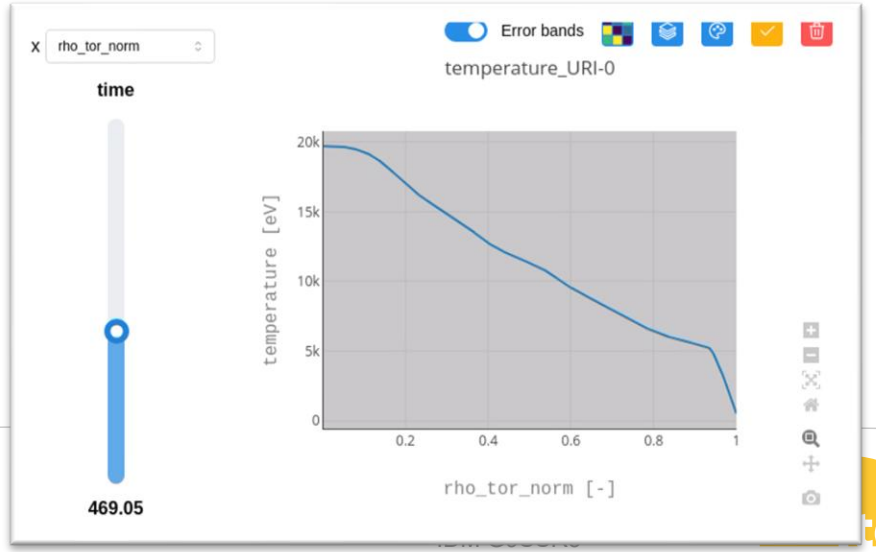
Select metadata
ADD ROW
RESET

IMAS tools for visualization and exploration

- **IDStools**
- **MINT**
- **IBEX**
- **IMAS-ParaView**



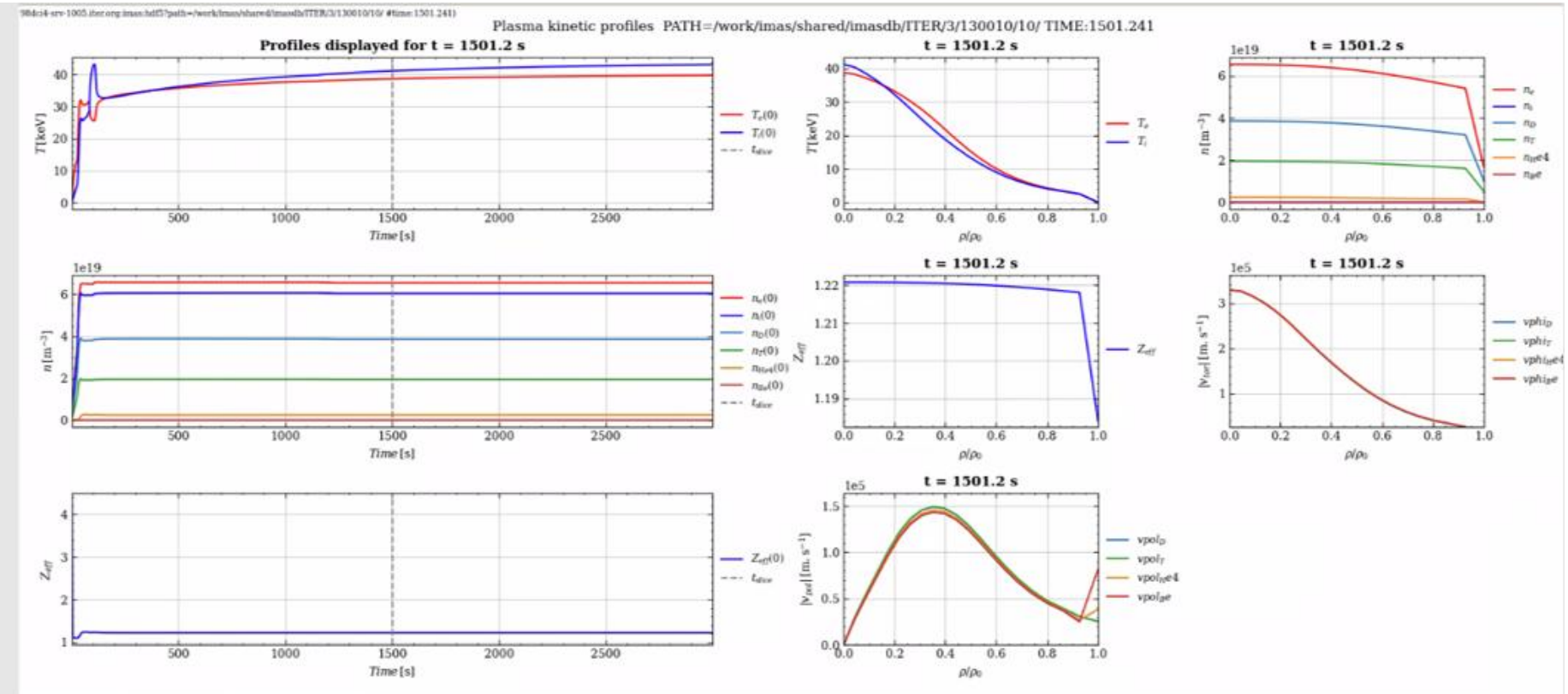




IDStools plot commands

One line plotting:

```
module load IDStools # on SDCC
plotkineticprofiles -u "imas:hdf5?path=/work/imas/shared/imasdb/ITER/3/130010/10/"
```



Manual

Github

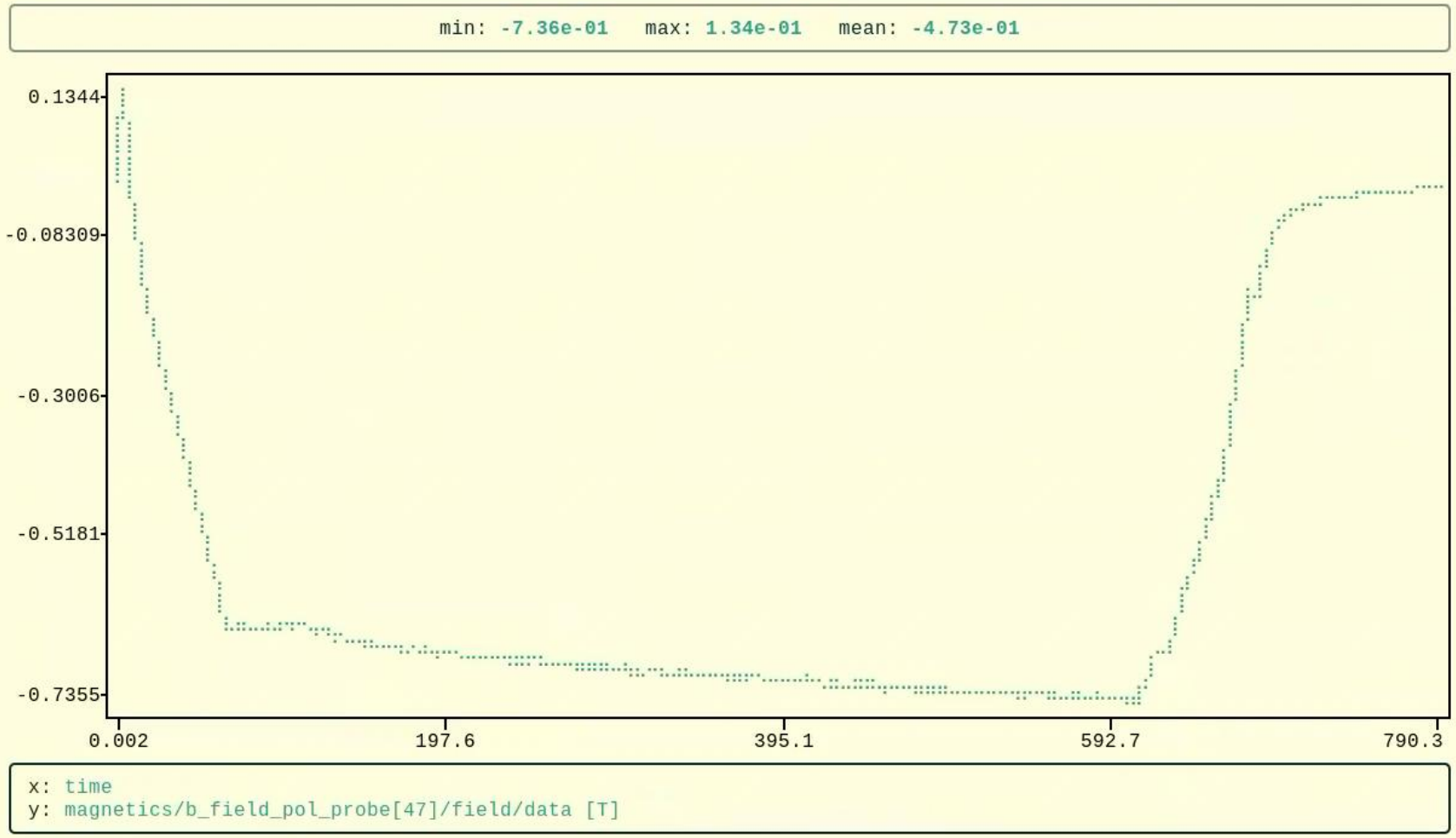
```
tribolp@98dci4-srv-1004:/home/ITER/tribolp>plot
plotcoresources          plotecray                plotequicomp             plothcddistributions     plotmachinedescription   plotrotation
plotcoretransport        plotecstrayradiation     plotequilibrium          plothcdwaves             plotneutron              plotscenario
ploteccomposition        plotedgeprofiles         plothcd                  plotkineticprofiles      plotpressure             plotspectrometry
```

IDStools plot commands

`idsprint` has ASCII plotting capabilities too:

```
idsprint -u "imas:hdf5?path=/work/imas/shared/imasdb/ITER/3/135011/7#magnetics/b_field_pol_probe[47]/field/data"
```

```
tribolp@98dci4-srv-1005:/home/ITER/tribolp>idsprint -u "imas:hdf5?path=/work/imas/shared/imasdb/ITER/3/135011/7#magnetics/b_field_pol_probe[47]/field/data"
12:49:22 INFO     Parsing data dictionary version 3.38.1 @dd_zip.py:89
<class 'imas.ids_primitive.IDSNumericArray'>
└── numpy.ndarray|(986,)|float64: <IDSNumericArray (IDS:magnetics, b_field_pol_probe[47]/field/data, FLT_1D)>
                                  numpy.ndarray([ 0.0017,  0.0126,  0.0294, ..., -0.0057, -0.0057, -0.0056], shape=(986,))
```



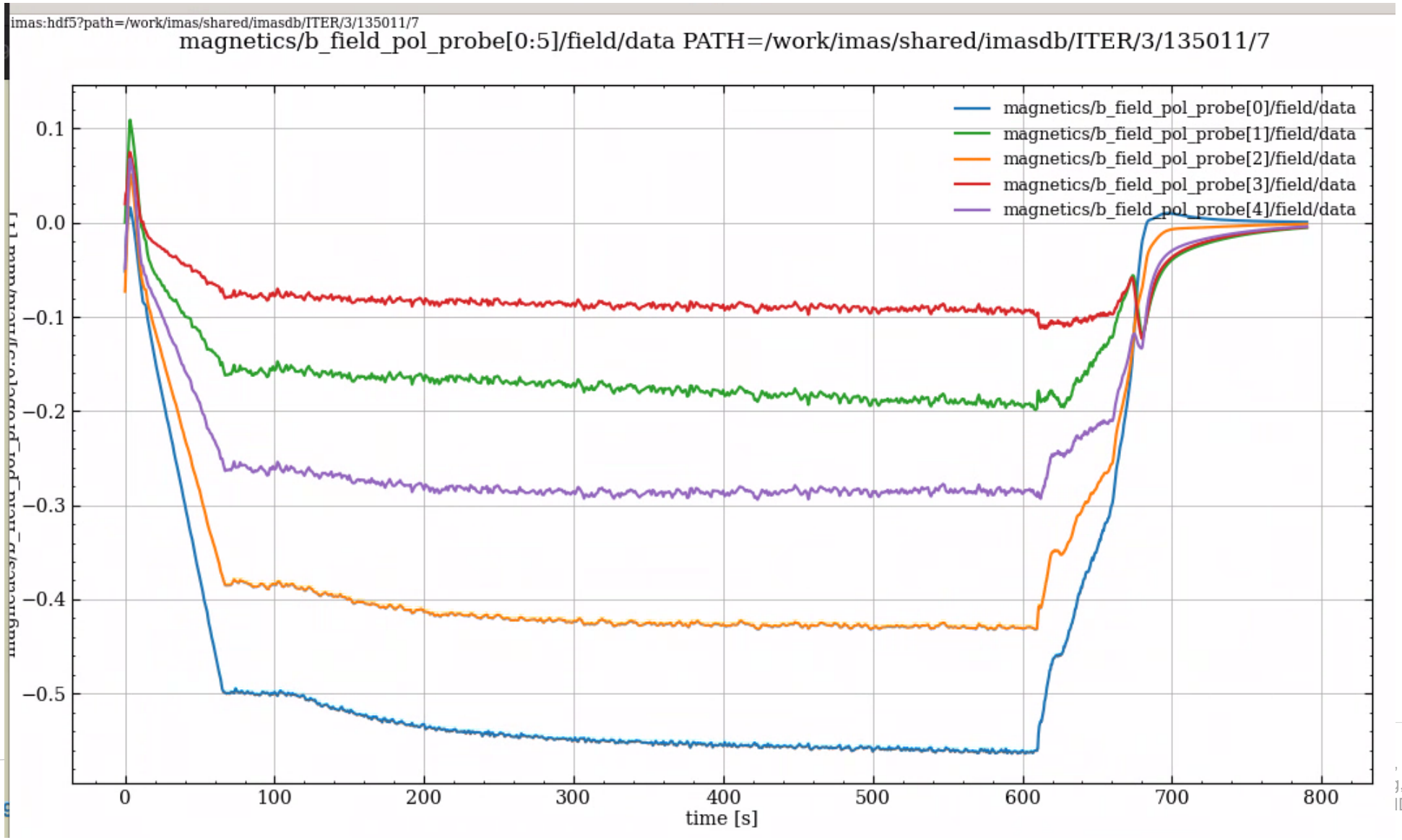
Manual

Github

IDStools plot commands

`idsprint` has ASCII plotting capabilities and ranges!

```
idsprint -u "imas:hdf5?path=/work/imas/shared/imasdb/ITER/3/135011/7#magnetics/b_field_pol_probe[0:5]/field/data" -p
```



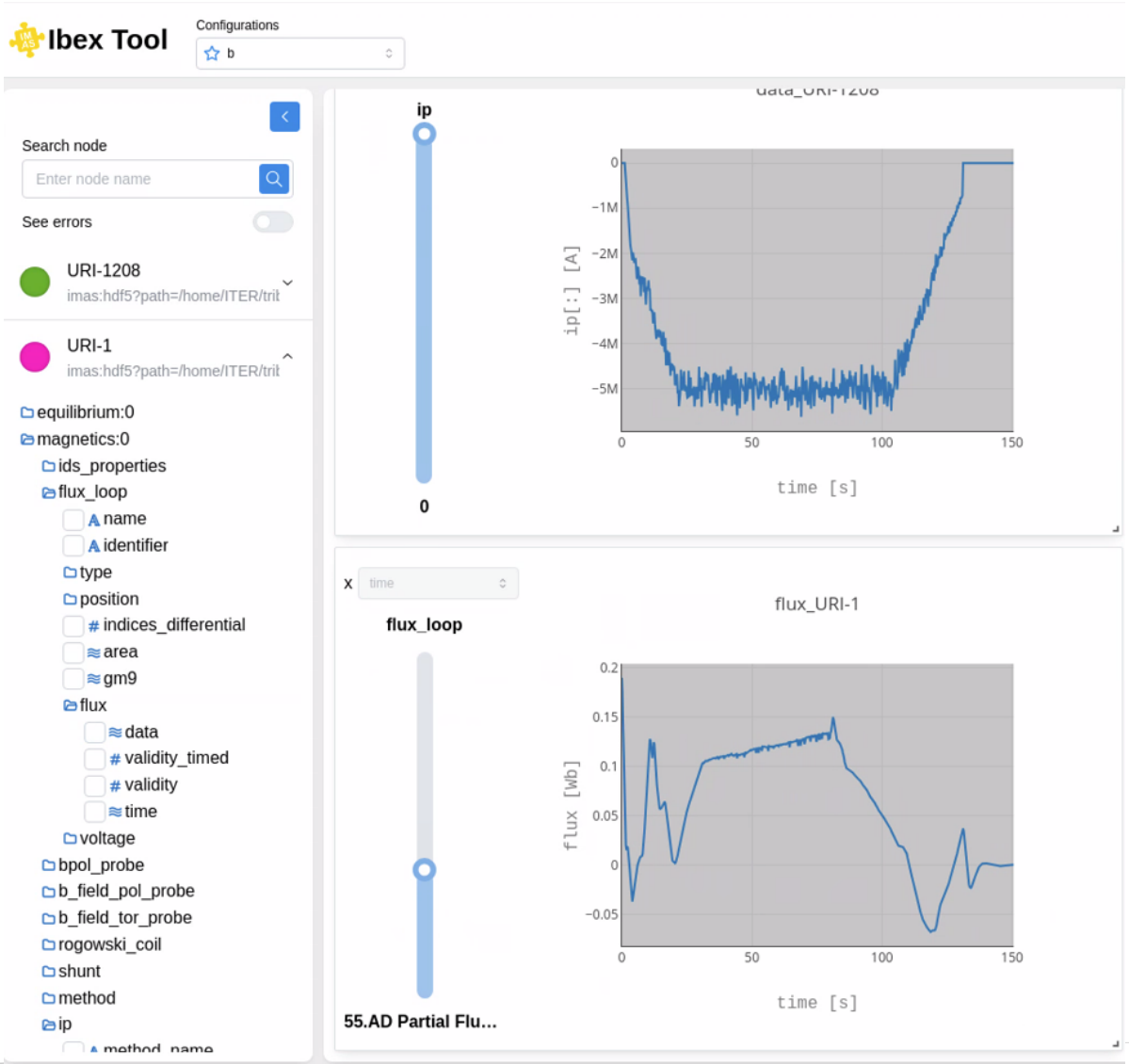
Manual

Github

IBEX

Interactive, the recommended tool for quick data exploration.

Here is a quick plot of Ip and some flux loop simulated data in IBEX:



Github

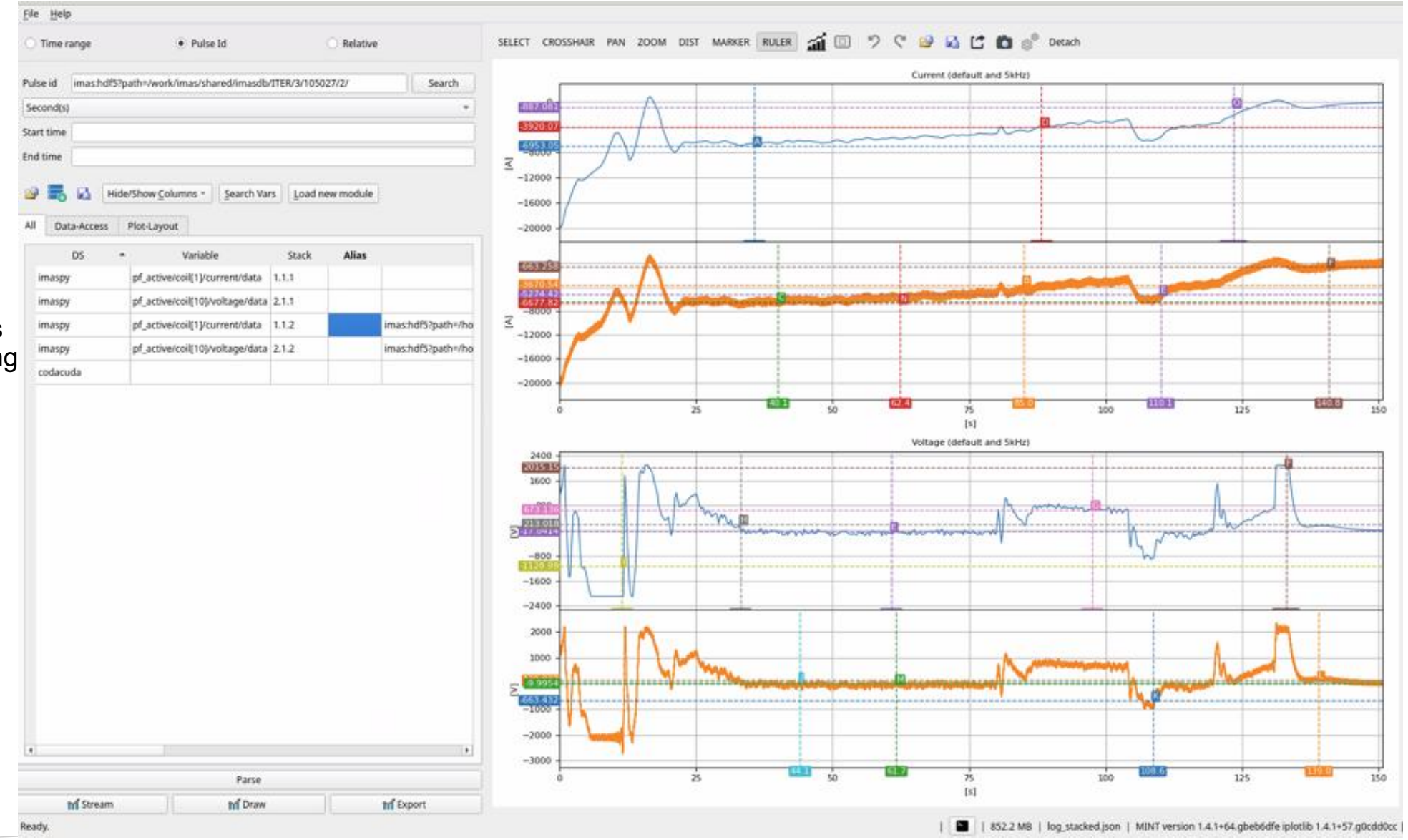
Manual

MINT

- It reads both IMAS and ITER CODAC data, the latter is served using an UDA plugin.
- Can **compare** signals, **calculate** new signals, etc, using python expressions;
- can also load python modules to extend the signal processing functionality.

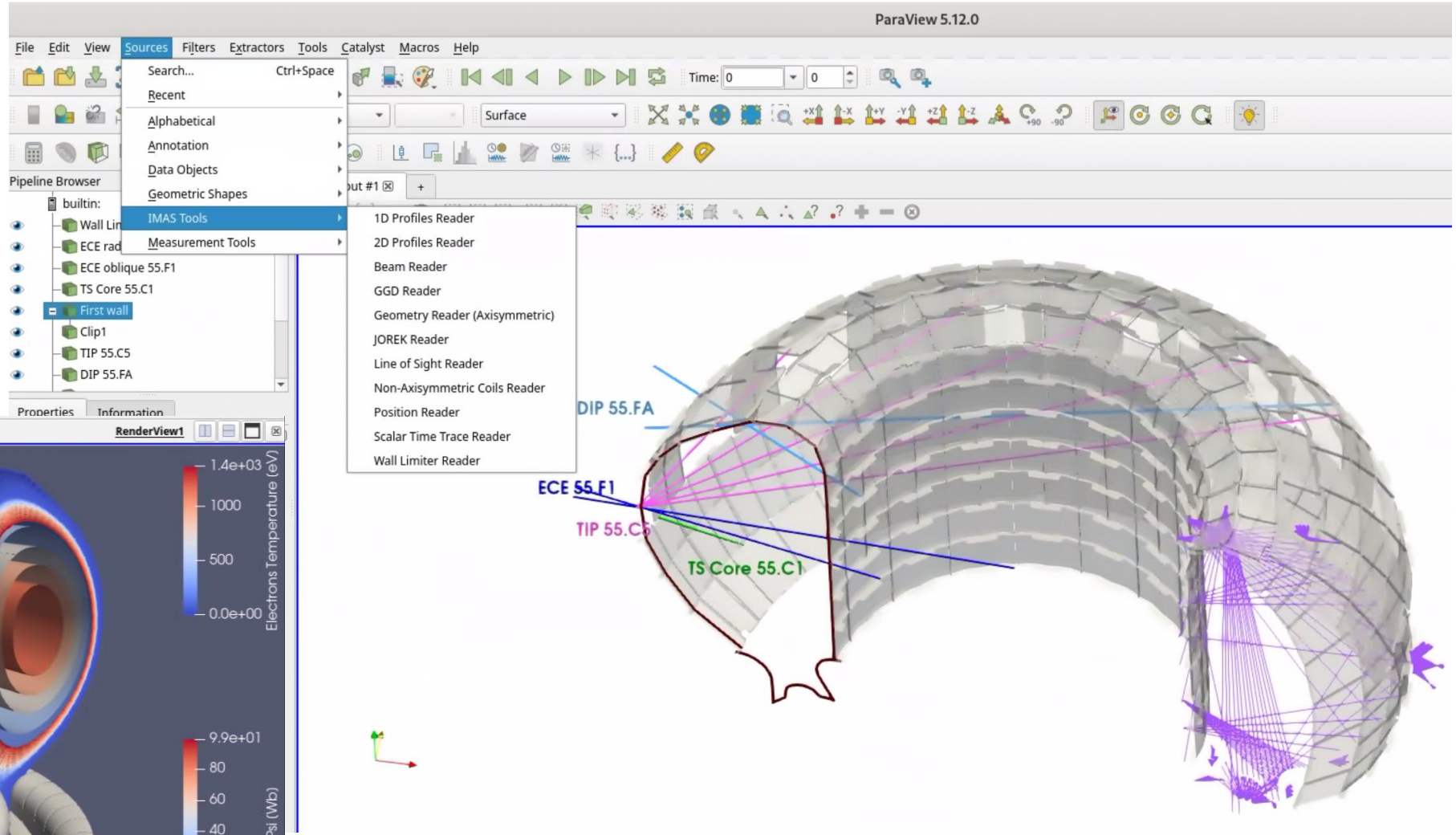
Github

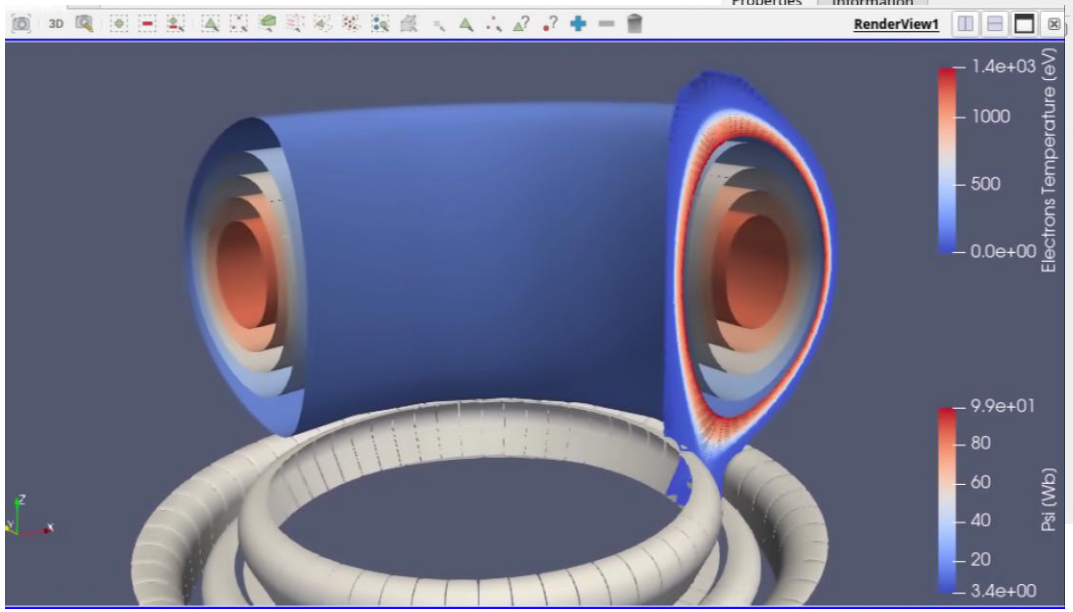
Manual



IMAS ParaView

- IMAS data source plugin for Paraview
- GGD for 2D and 3D data
- 1D profiles
- Many **diagnostic description** (LoS, FoV, position, etc):





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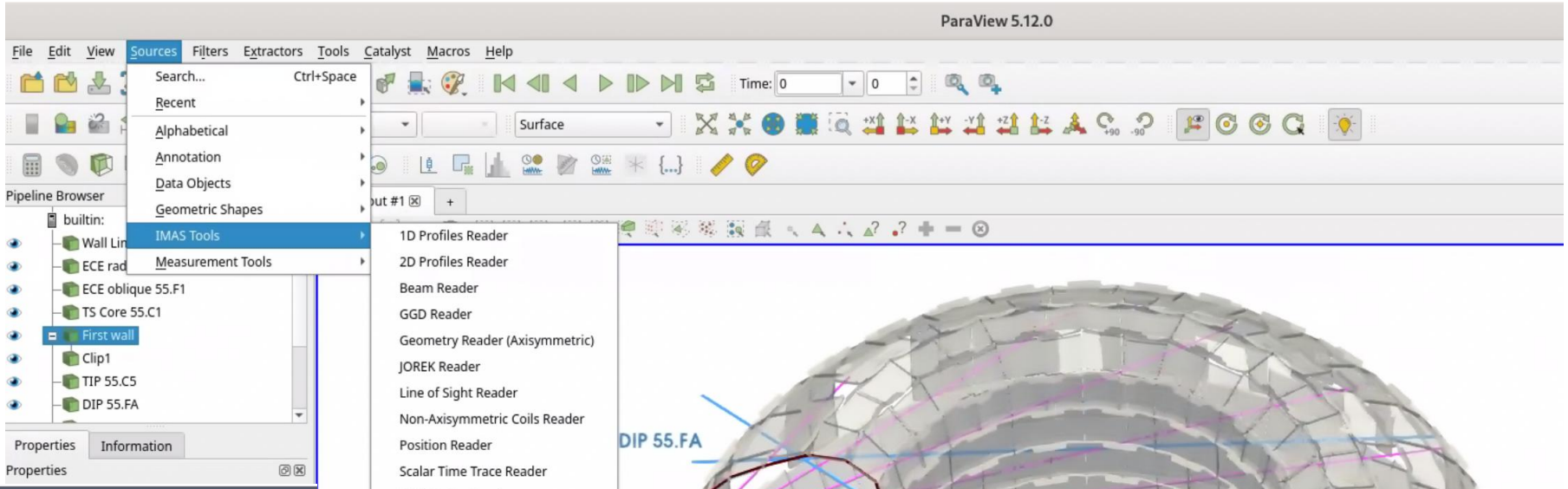

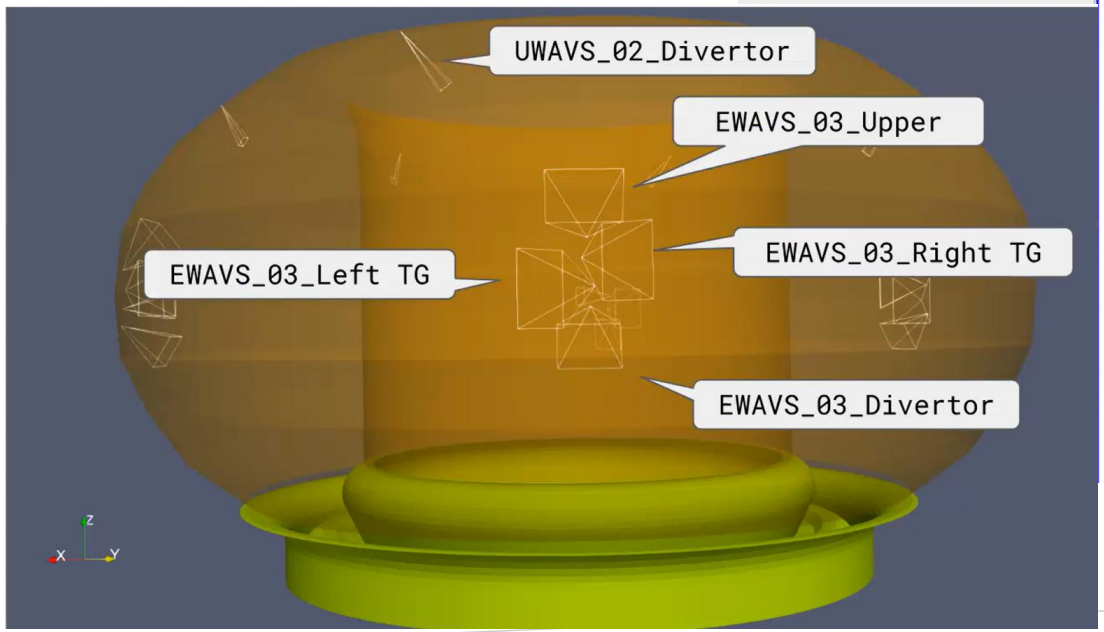

Thank you!