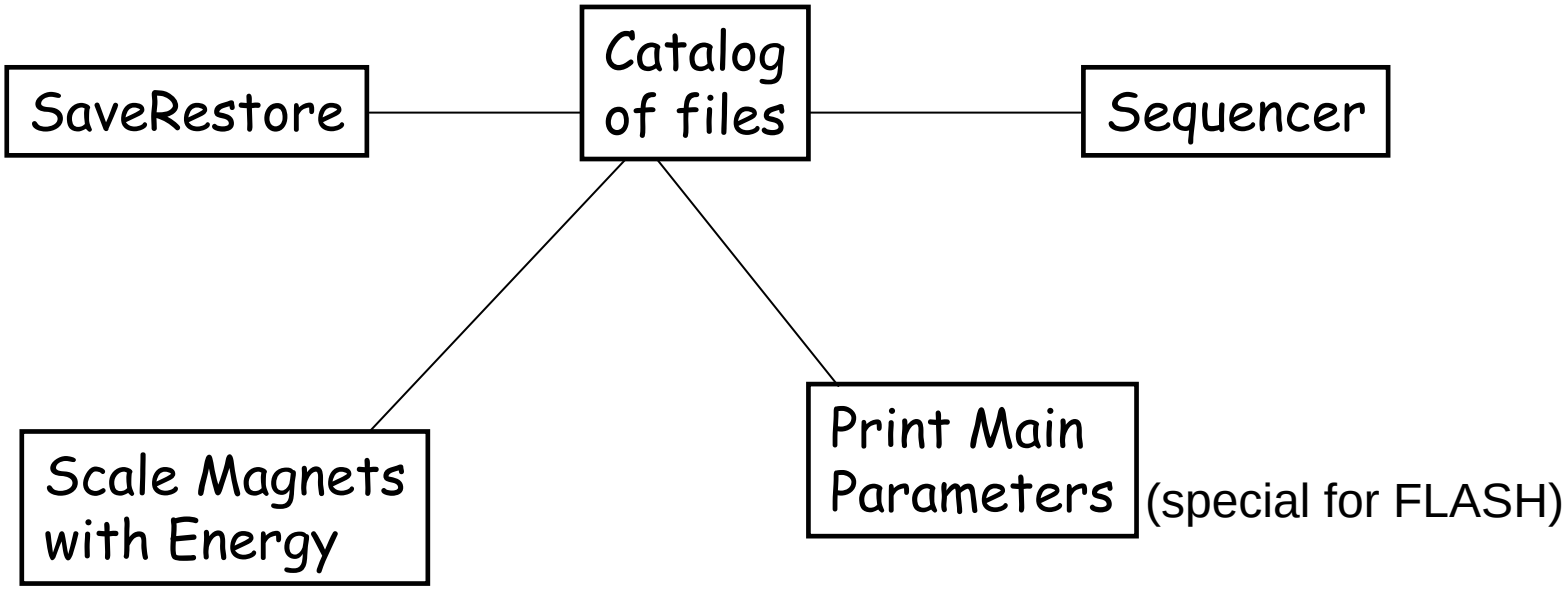
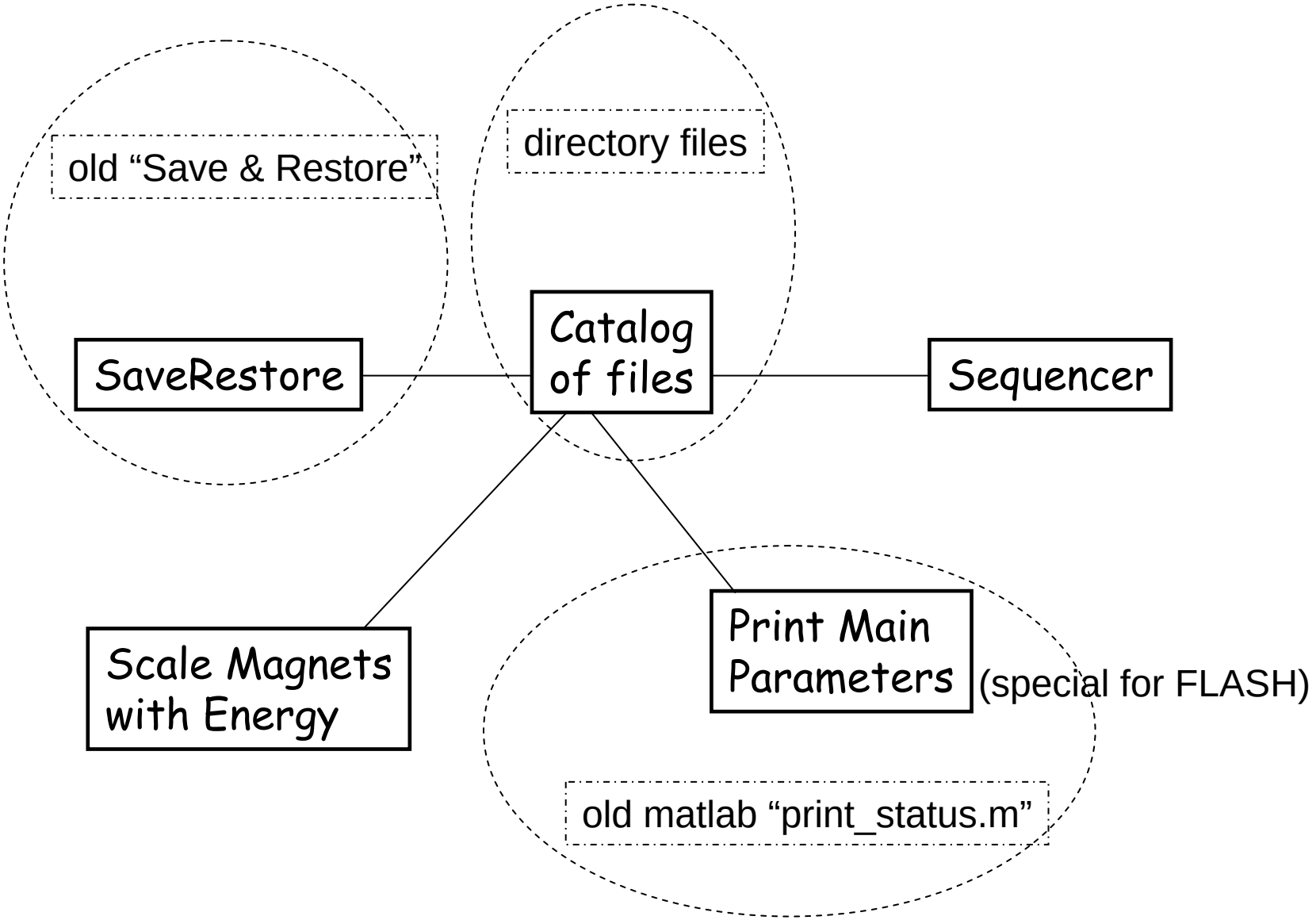
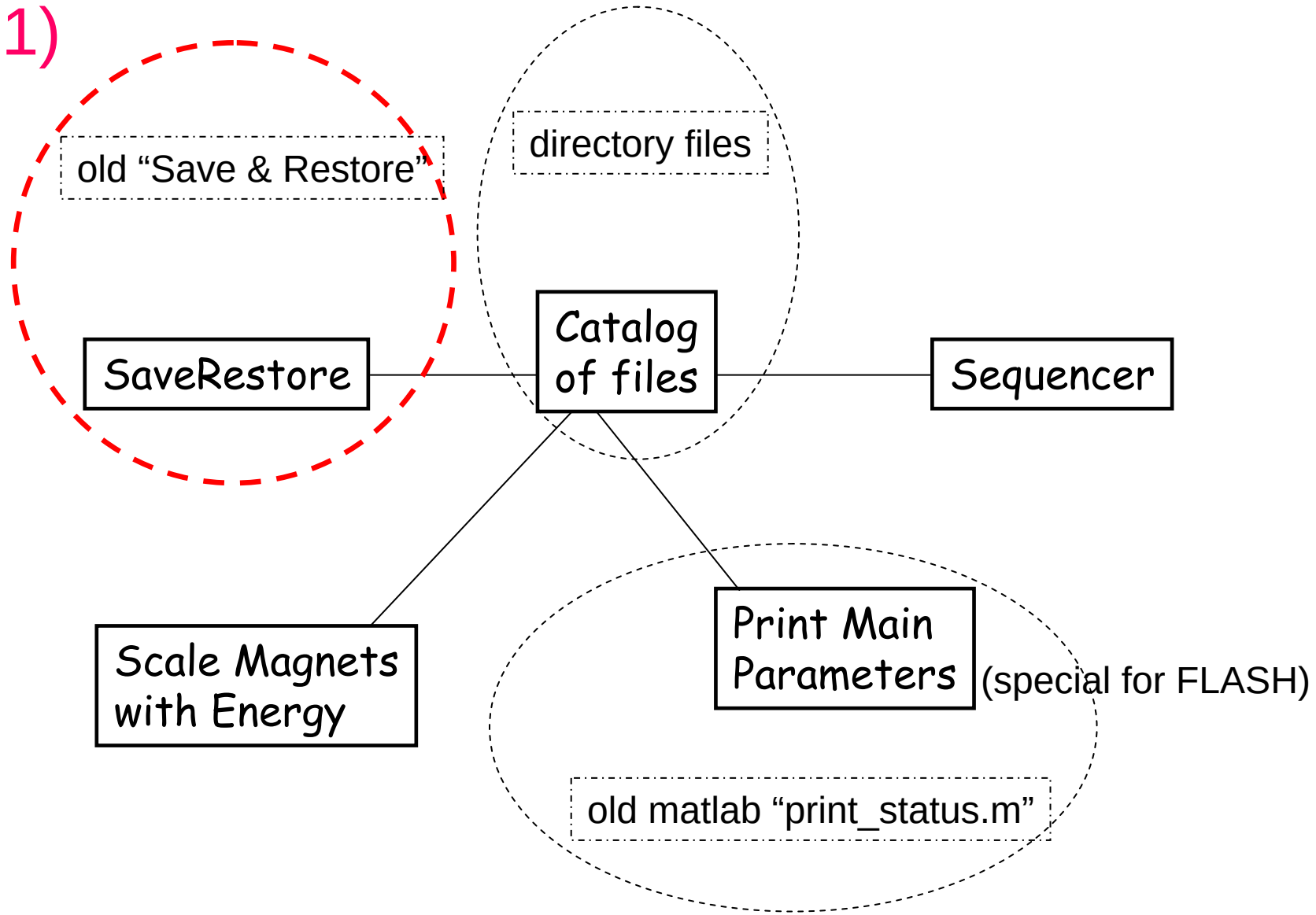
The File Catalog System at FLASH: a tutorial

Jürgen Maass (MCS4) and Pedro Castro (MPY)

in collaboration with:
K. Rehlich, R. Kammering, O. Hensler, E. Sombrowski, S. Herb
and other people from MCS 1 and MCS 4

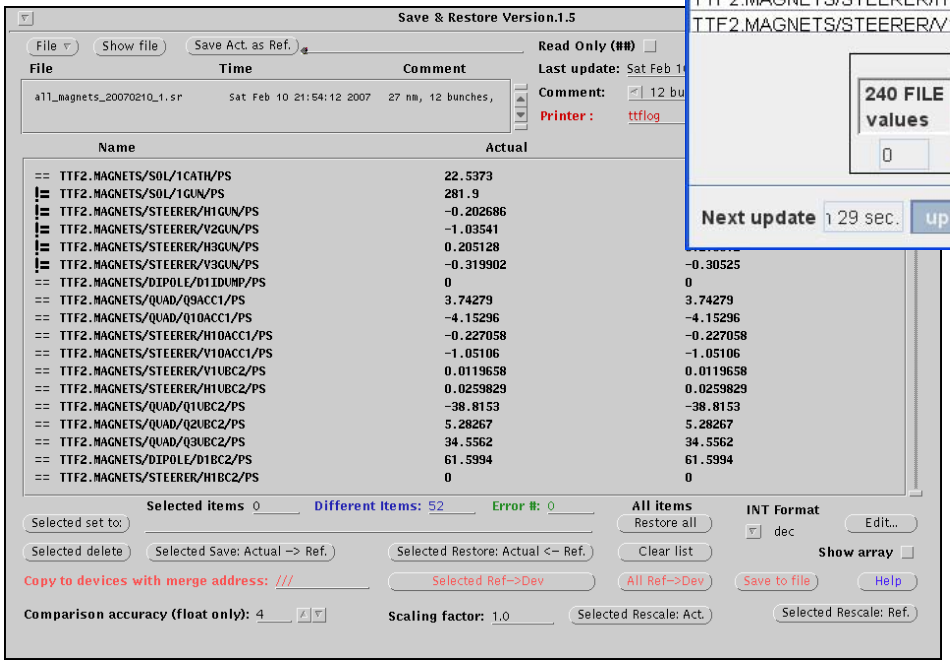

SaveRestore
Catalog of files
Sequencer
Scale Magnets with Energy
Print Main Parameters
(special for FLASH)

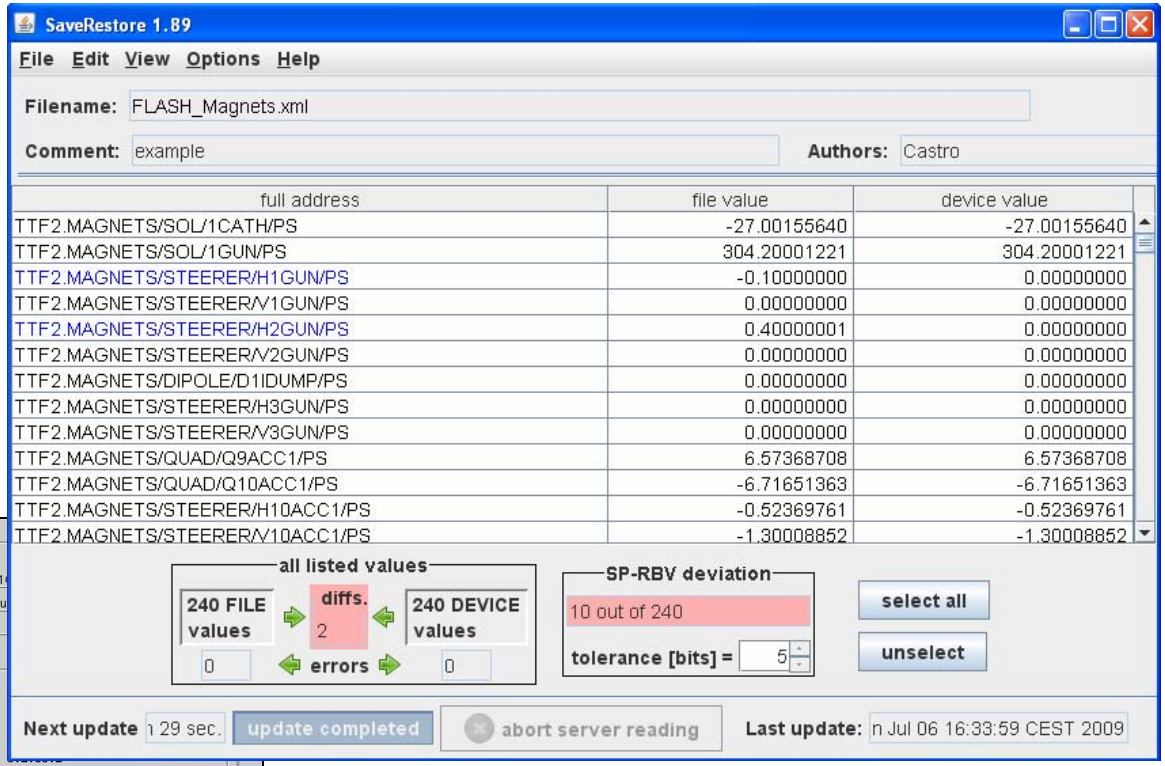

old “Save & Restore”
directory files
SaveRestore
Catalog of files
Sequencer
Scale Magnets with Energy
Print Main Parameters
(special for FLASH)
old matlab “print_status.m”


1)
old “Save & Restore”
directory files
SaveRestore
Catalog of files
Sequencer
Scale Magnets with Energy
Print Main Parameters
(special for FLASH)
old matlab “print_status.m”

"old" vs "new" Save & Restore tools

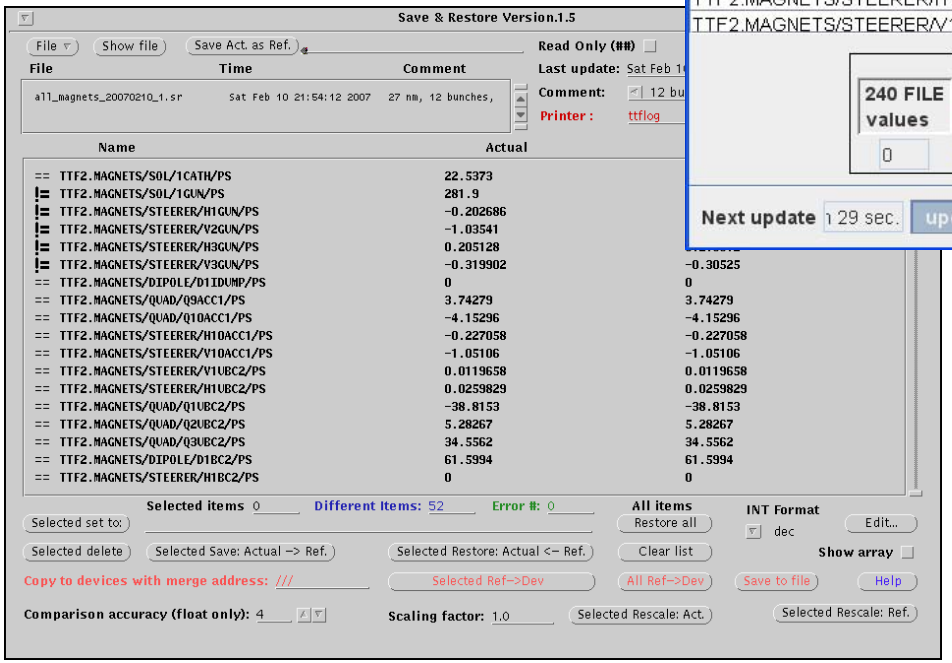
versus

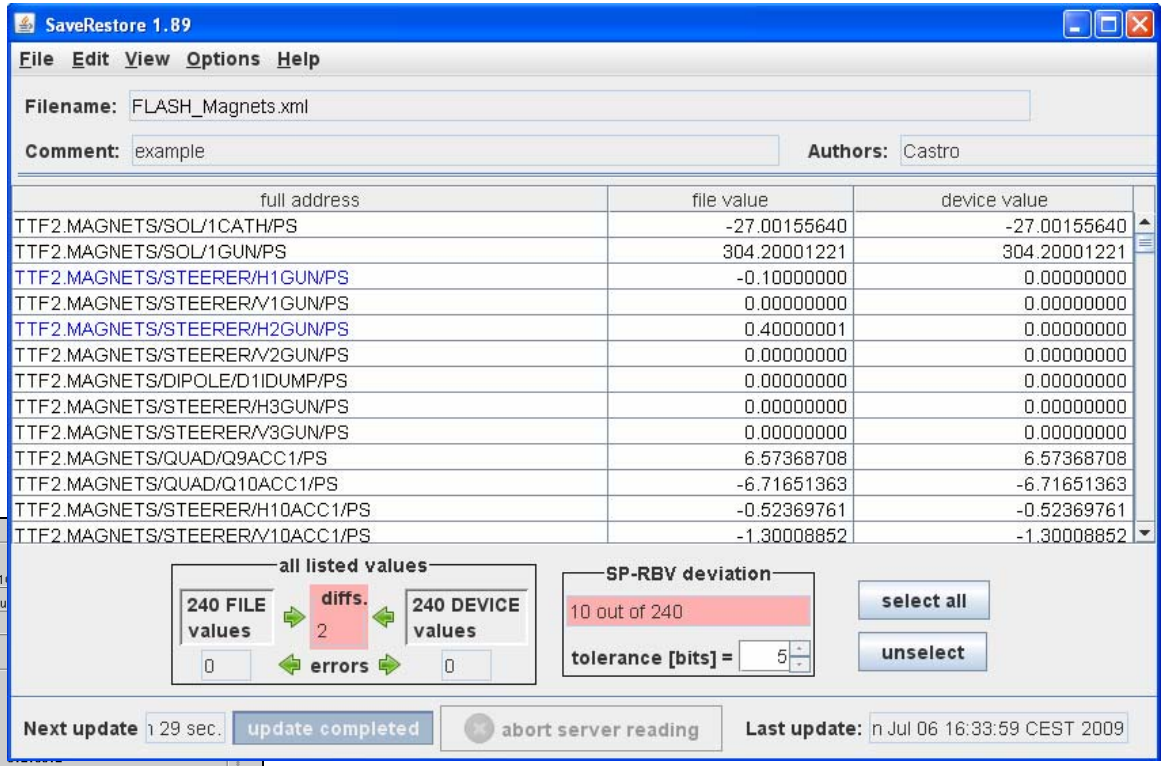




"old" vs "new" Save & Restore tools

versus

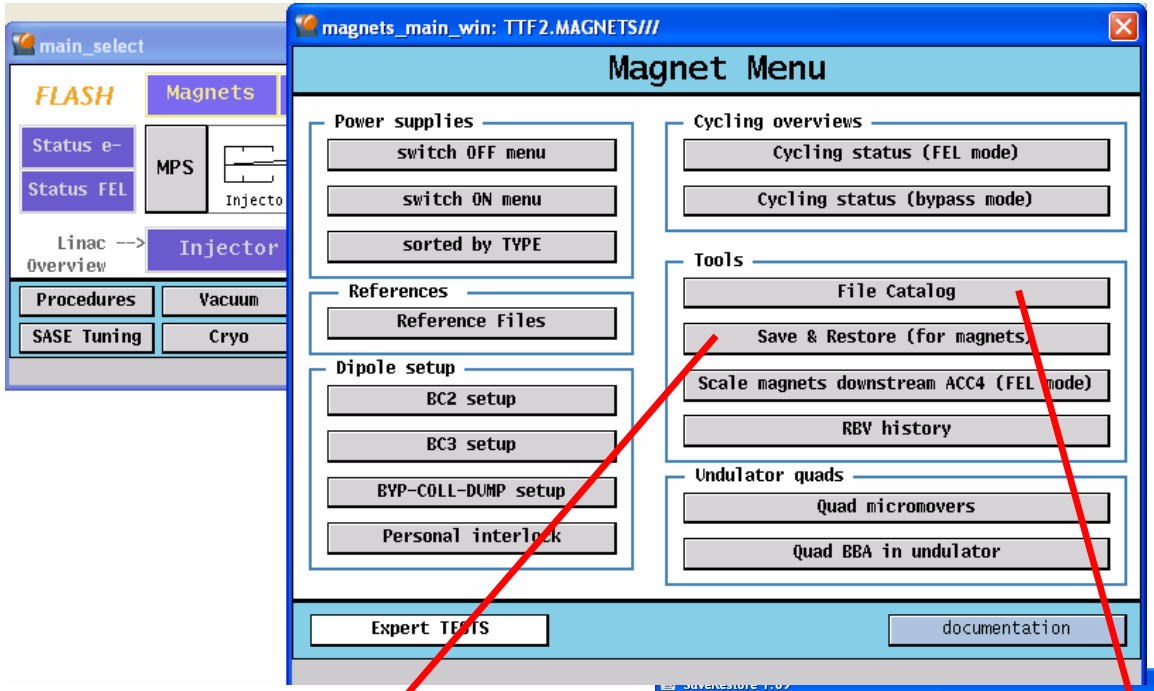


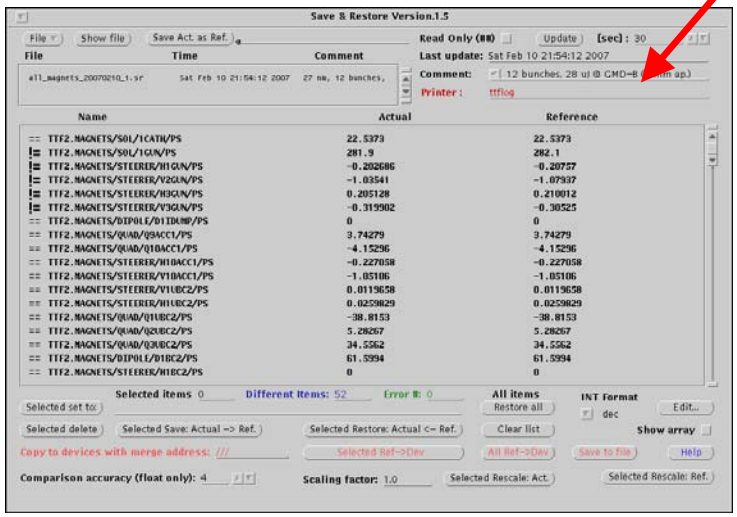


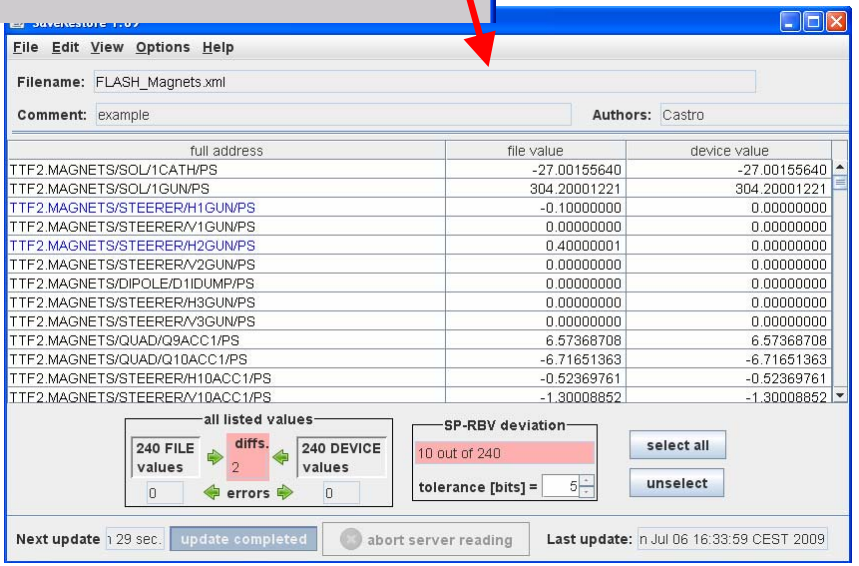
new version in Java:

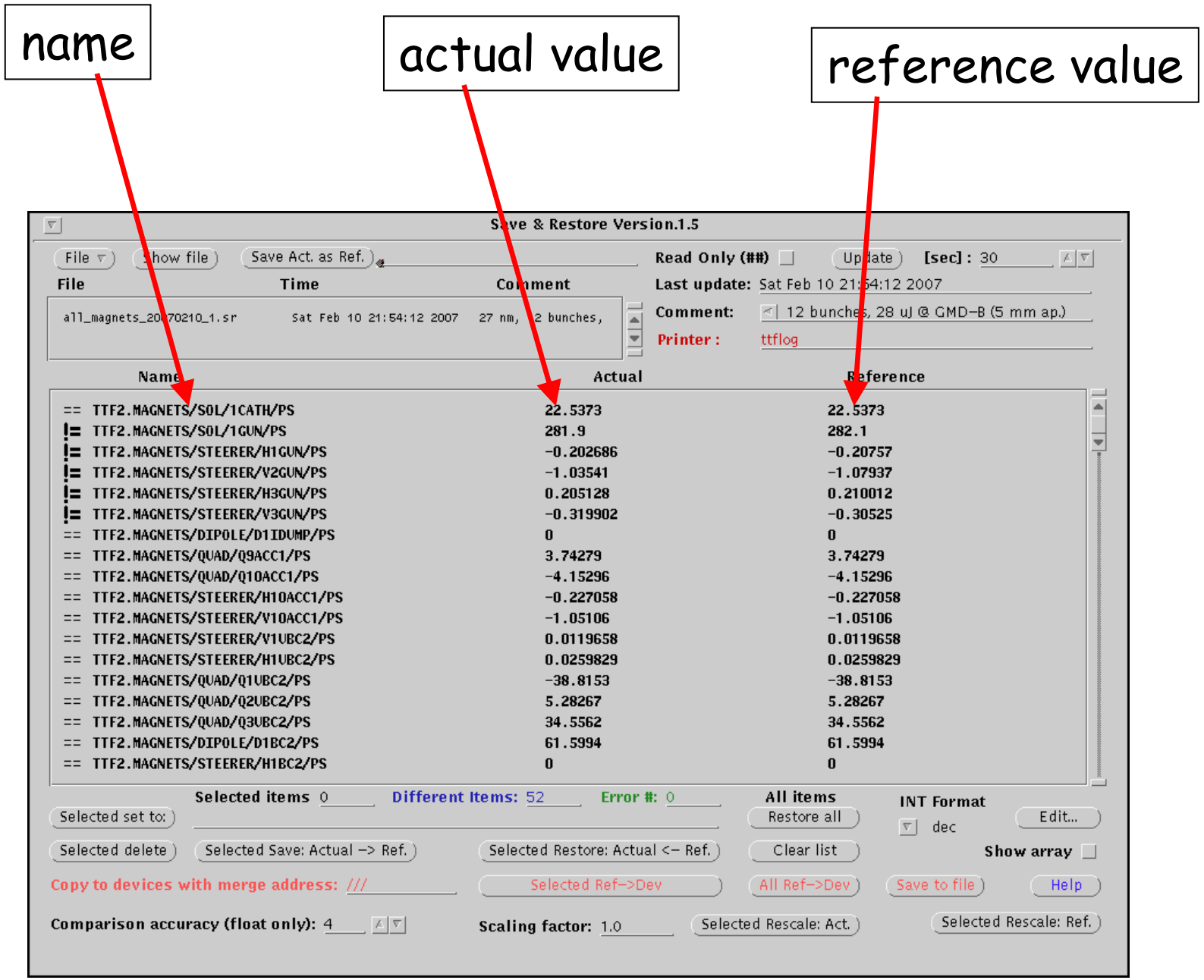
- beta version
- starts very slow

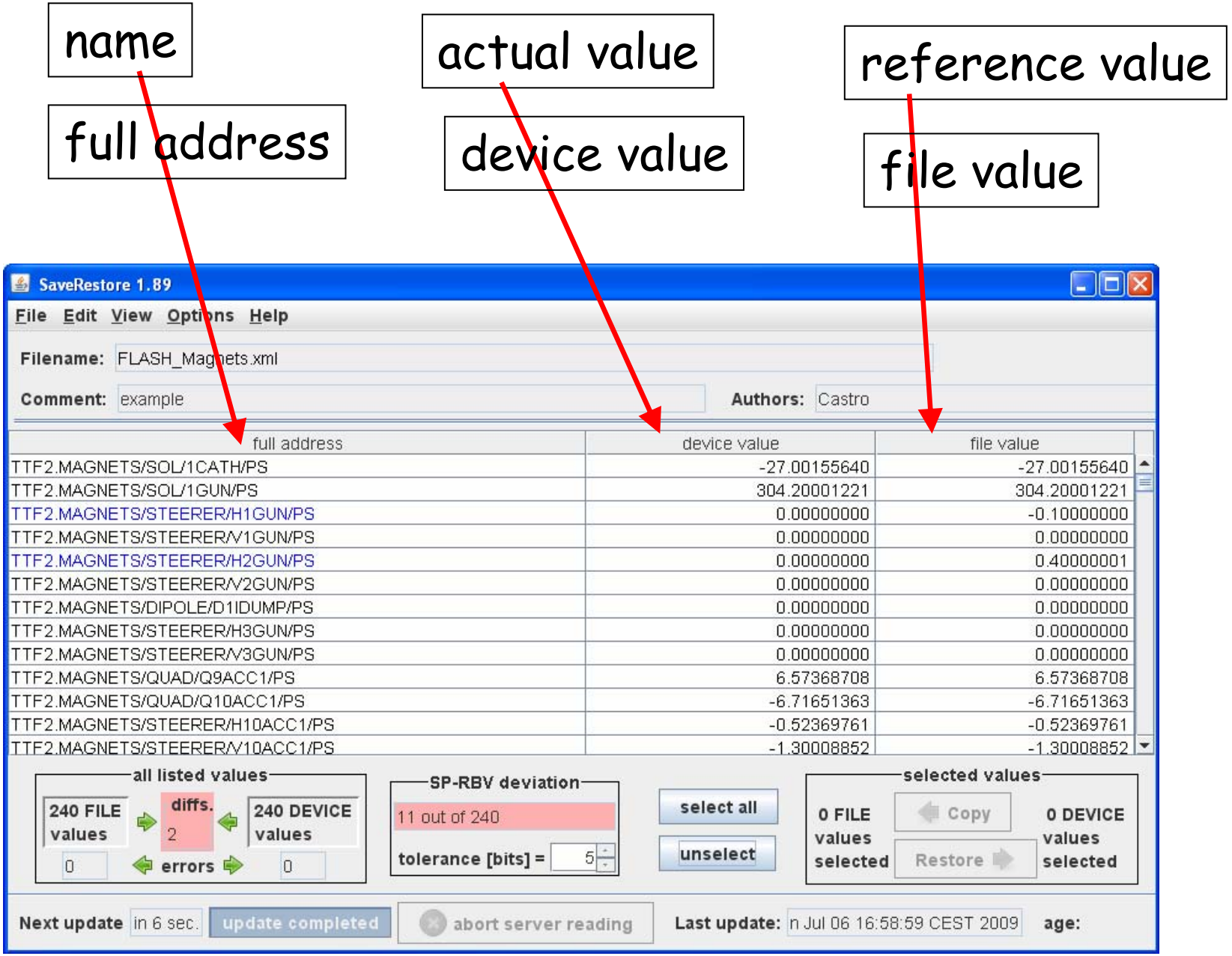
To start the programs:








name
actual value
reference value
Save & Restore Version.1.5
File
Show file
Save Act. as Ref.
Read Only (##)
Update
[sec] : 30
File
Time
Comment
Last update: Sat Feb 10 21:54:12 2007
all_magnets_20070210_1.sr Sat Feb 10 21:54:12 2007 27 nm, 2 bunches,
Comment: 12 bunches, 28 uJ @ GMD-B (5 mm ap.)
Printer : ttflog
Name
Actual
Reference
== TTF2.MAGNETS/SOL/1CATH/PS 22.5373 22.5373
!= TTF2.MAGNETS/SOL/1GUN/PS 281.9 282.1
!= TTF2.MAGNETS/STEERER/H1GUN/PS -0.202686 -0.20757
!= TTF2.MAGNETS/STEERER/V2GUN/PS -1.03541 -1.07937
!= TTF2.MAGNETS/STEERER/H3GUN/PS 0.205128 0.210012
!= TTF2.MAGNETS/STEERER/V3GUN/PS -0.319902 -0.30525
== TTF2.MAGNETS/DIPOLE/D1IDUMP/PS 0 0
== TTF2.MAGNETS/QUAD/Q9ACC1/PS 3.74279 3.74279
== TTF2.MAGNETS/QUAD/Q10ACC1/PS -4.15296 -4.15296
== TTF2.MAGNETS/STEERER/H10ACC1/PS -0.227058 -0.227058
== TTF2.MAGNETS/STEERER/V10ACC1/PS -1.05106 -1.05106
== TTF2.MAGNETS/STEERER/V1UBC2/PS 0.0119658 0.0119658
== TTF2.MAGNETS/STEERER/H1UBC2/PS 0.0259829 0.0259829
== TTF2.MAGNETS/QUAD/Q1UBC2/PS -38.8153 -38.8153
== TTF2.MAGNETS/QUAD/Q2UBC2/PS 5.28267 5.28267
== TTF2.MAGNETS/QUAD/Q3UBC2/PS 34.5562 34.5562
== TTF2.MAGNETS/DIPOLE/D1BC2/PS 61.5994 61.5994
== TTF2.MAGNETS/STEERER/H1BC2/PS 0 0
Selected items 0
Different Items: 52
Error #: 0
All items
INT Format
Selected set to:
Restore all
dec
Edit...
Selected delete
Selected Save: Actual -> Ref.
Selected Restore: Actual <- Ref.
Clear list
Show array
Copy to devices with merge address: ///
Selected Ref->Dev
All Ref->Dev
Save to file
Help
Comparison accuracy (float only): 4
Scaling factor: 1.0
Selected Rescale: Act.
Selected Rescale: Ref.


name
full address
actual value
device value
reference value
file value
SaveRestore 1.89
File Edit View Options Help
Filename: FLASH_Magnets.xml
Comment: example
Authors: Castro
full address
device value
file value
TTF2.MAGNETS/SOL/1CATH/PS -27.00155640 -27.00155640
TTF2.MAGNETS/SOL/1GUN/PS 304.20001221 304.20001221
TTF2.MAGNETS/STEERER/H1GUN/PS 0.00000000 -0.10000000
TTF2.MAGNETS/STEERER/V1GUN/PS 0.00000000 0.00000000
TTF2.MAGNETS/STEERER/H2GUN/PS 0.00000000 0.40000001
TTF2.MAGNETS/STEERER/V2GUN/PS 0.00000000 0.00000000
TTF2.MAGNETS/DIPOLE/D1IDUMP/PS 0.00000000 0.00000000
TTF2.MAGNETS/STEERER/H3GUN/PS 0.00000000 0.00000000
TTF2.MAGNETS/STEERER/V3GUN/PS 0.00000000 0.00000000
TTF2.MAGNETS/QUAD/Q9ACC1/PS 6.57368708 6.57368708
TTF2.MAGNETS/QUAD/Q10ACC1/PS -6.71651363 -6.71651363
TTF2.MAGNETS/STEERER/H10ACC1/PS -0.52369761 -0.52369761
TTF2.MAGNETS/STEERER/V10ACC1/PS -1.30008852 -1.30008852
all listed values
240 FILE values
diffs. 2
240 DEVICE values
0
errors
0
SP-RBV deviation
11 out of 240
tolerance [bits] = 5
select all
unselect
selected values
0 FILE values selected
Copy
Restore
0 DEVICE values selected
Next update in 6 sec.
update completed
abort server reading
Last update: n Jul 06 16:58:59 CEST 2009
age:

Extras:

name

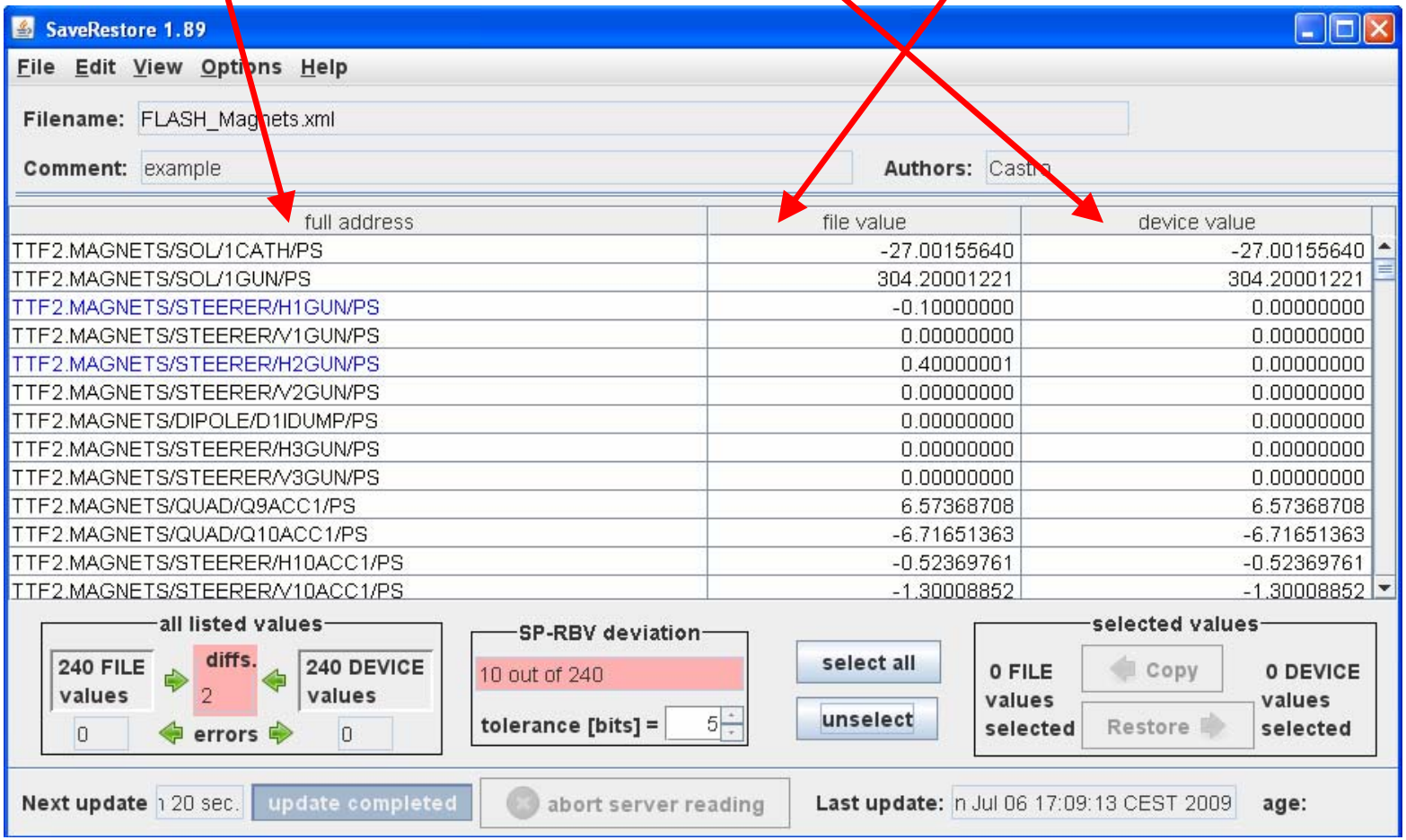
full address

actual value

device value

reference value

file value



Extras:

name

full address

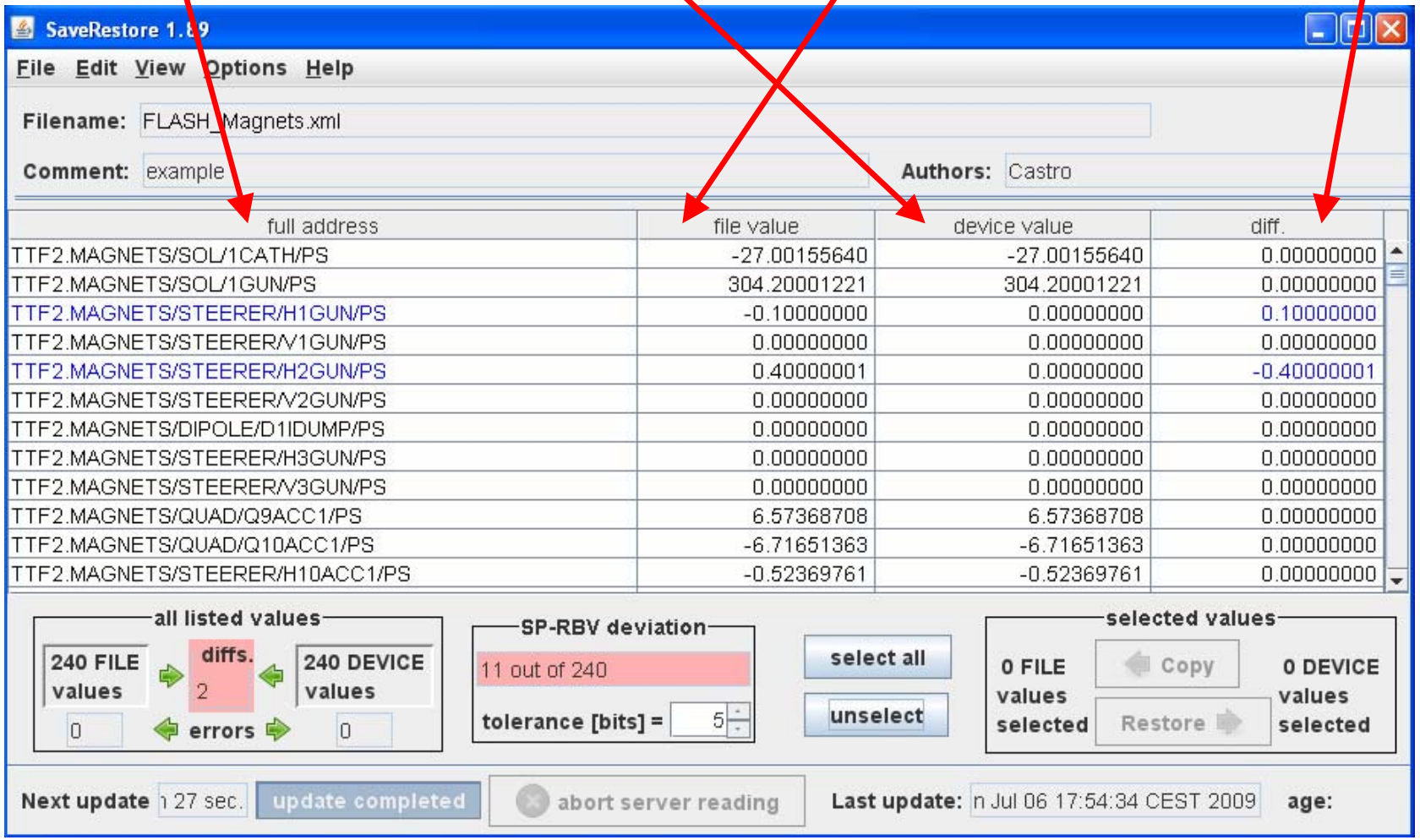
actual value

device value

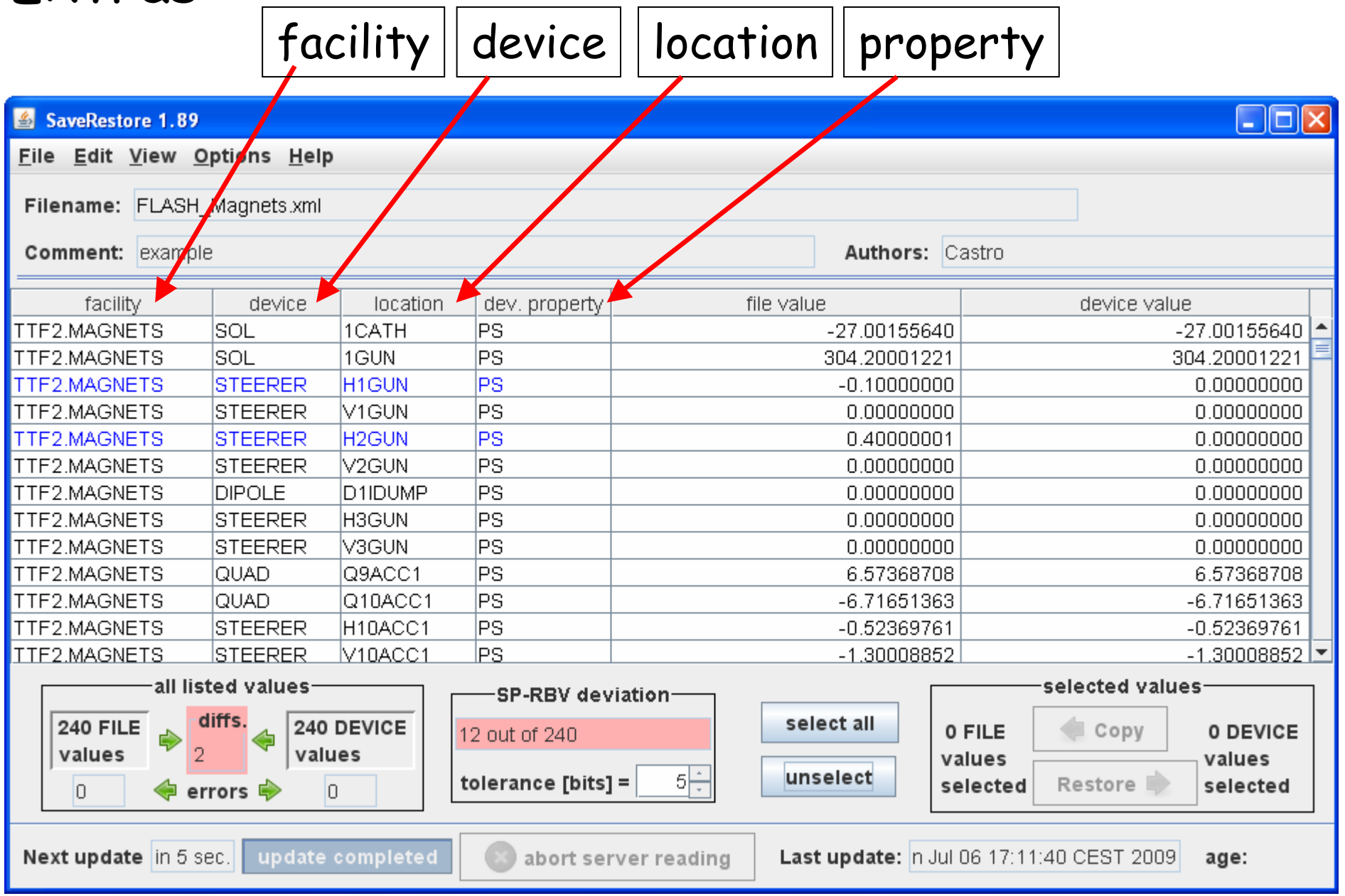
reference value

file value

difference

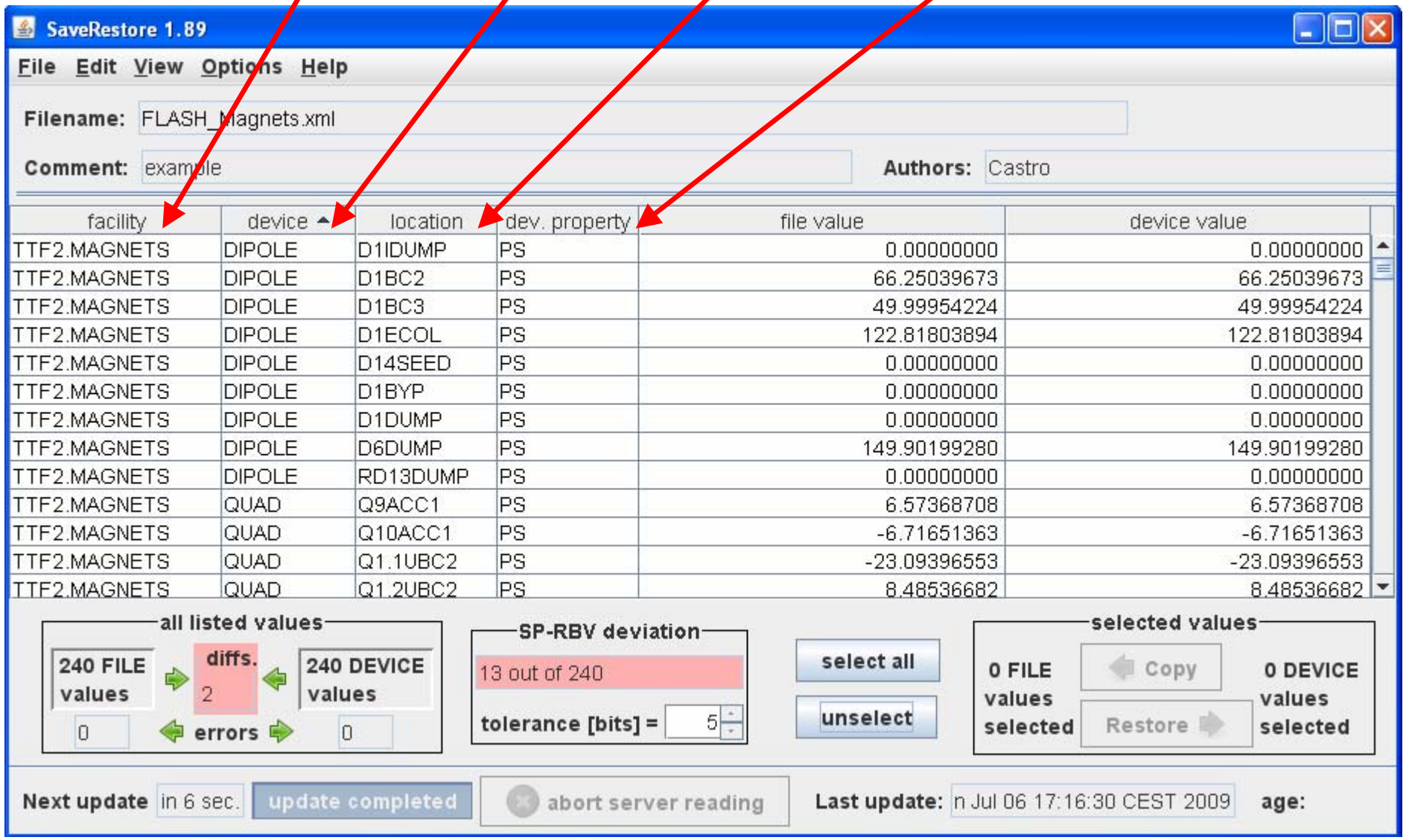


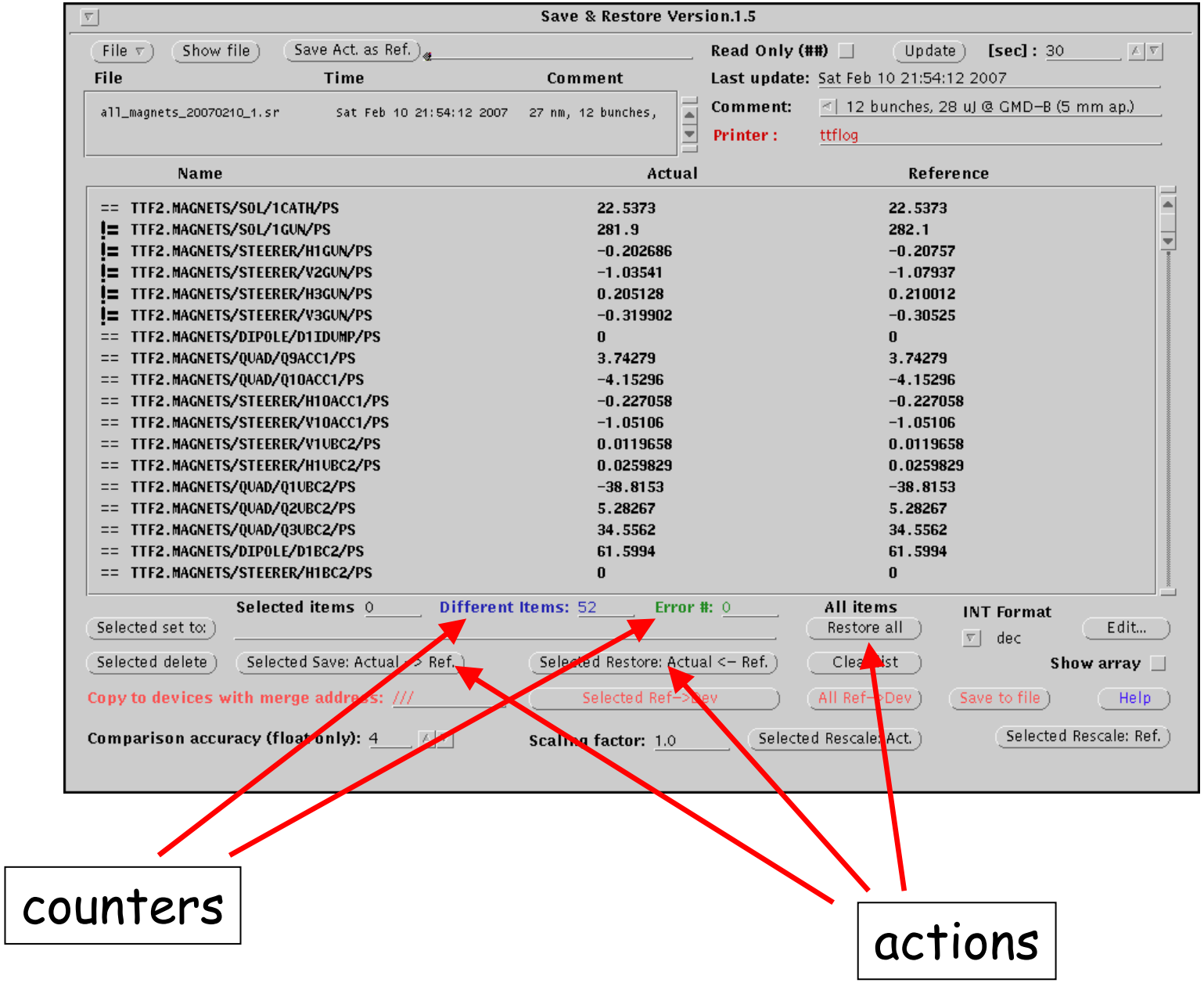
Extras:


facility
device
location
property
SaveRestore 1.89
File Edit View Options Help
Filename: FLASH_Magnets.xml
Comment: example
Authors: Castro
facility | device | location | dev. property | file value | device value
TTF2.MAGNETS | SOL | 1CATH | PS | -27.00155640 | -27.00155640
TTF2.MAGNETS | SOL | 1GUN | PS | 304.20001221 | 304.20001221
TTF2.MAGNETS | STEERER | H1GUN | PS | -0.10000000 | 0.00000000
TTF2.MAGNETS | STEERER | V1GUN | PS | 0.00000000 | 0.00000000
TTF2.MAGNETS | STEERER | H2GUN | PS | 0.40000001 | 0.00000000
TTF2.MAGNETS | STEERER | V2GUN | PS | 0.00000000 | 0.00000000
TTF2.MAGNETS | DIPOLE | D1IDUMP | PS | 0.00000000 | 0.00000000
TTF2.MAGNETS | STEERER | H3GUN | PS | 0.00000000 | 0.00000000
TTF2.MAGNETS | STEERER | V3GUN | PS | 0.00000000 | 0.00000000
TTF2.MAGNETS | QUAD | Q9ACC1 | PS | 6.57368708 | 6.57368708
TTF2.MAGNETS | QUAD | Q10ACC1 | PS | -6.71651363 | -6.71651363
TTF2.MAGNETS | STEERER | H10ACC1 | PS | -0.52369761 | -0.52369761
TTF2.MAGNETS | STEERER | V10ACC1 | PS | -1.30008852 | -1.30008852
all listed values
240 FILE values
diffs. 2
240 DEVICE values
0
errors
0
SP-RBV deviation
12 out of 240
tolerance [bits] = 5
select all
unselect
selected values
0 FILE values selected
Copy
Restore
0 DEVICE values selected
Next update in 5 sec.
update completed
abort server reading
Last update: n Jul 06 17:11:40 CEST 2009
age:

Extras: all columns can be sorted

facility | device | location | property




Save & Restore Version.1.5
File
Show file
Save Act. as Ref.
Read Only (##)
Update
[sec] : 30
File
Time
Comment
all_magnets_20070210_1.sr
Sat Feb 10 21:54:12 2007
27 nm, 12 bunches,
Last update: Sat Feb 10 21:54:12 2007
Comment: 12 bunches, 28 uJ @ GMD-B (5 mm ap.)
Printer : ttflog
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== TTF2.MAGNETS/SOL/1CATH/PS 22.5373 22.5373
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!= TTF2.MAGNETS/STEERER/H1GUN/PS -0.202686 -0.20757
!= TTF2.MAGNETS/STEERER/V2GUN/PS -1.03541 -1.07937
!= TTF2.MAGNETS/STEERER/H3GUN/PS 0.205128 0.210012
!= TTF2.MAGNETS/STEERER/V3GUN/PS -0.319902 -0.30525
== TTF2.MAGNETS/DIPOLE/D1IDUMP/PS 0 0
== TTF2.MAGNETS/QUAD/Q9ACC1/PS 3.74279 3.74279
== TTF2.MAGNETS/QUAD/Q10ACC1/PS -4.15296 -4.15296
== TTF2.MAGNETS/STEERER/H10ACC1/PS -0.227058 -0.227058
== TTF2.MAGNETS/STEERER/V10ACC1/PS -1.05106 -1.05106
== TTF2.MAGNETS/STEERER/V1UBC2/PS 0.0119658 0.0119658
== TTF2.MAGNETS/STEERER/H1UBC2/PS 0.0259829 0.0259829
== TTF2.MAGNETS/QUAD/Q1UBC2/PS -38.8153 -38.8153
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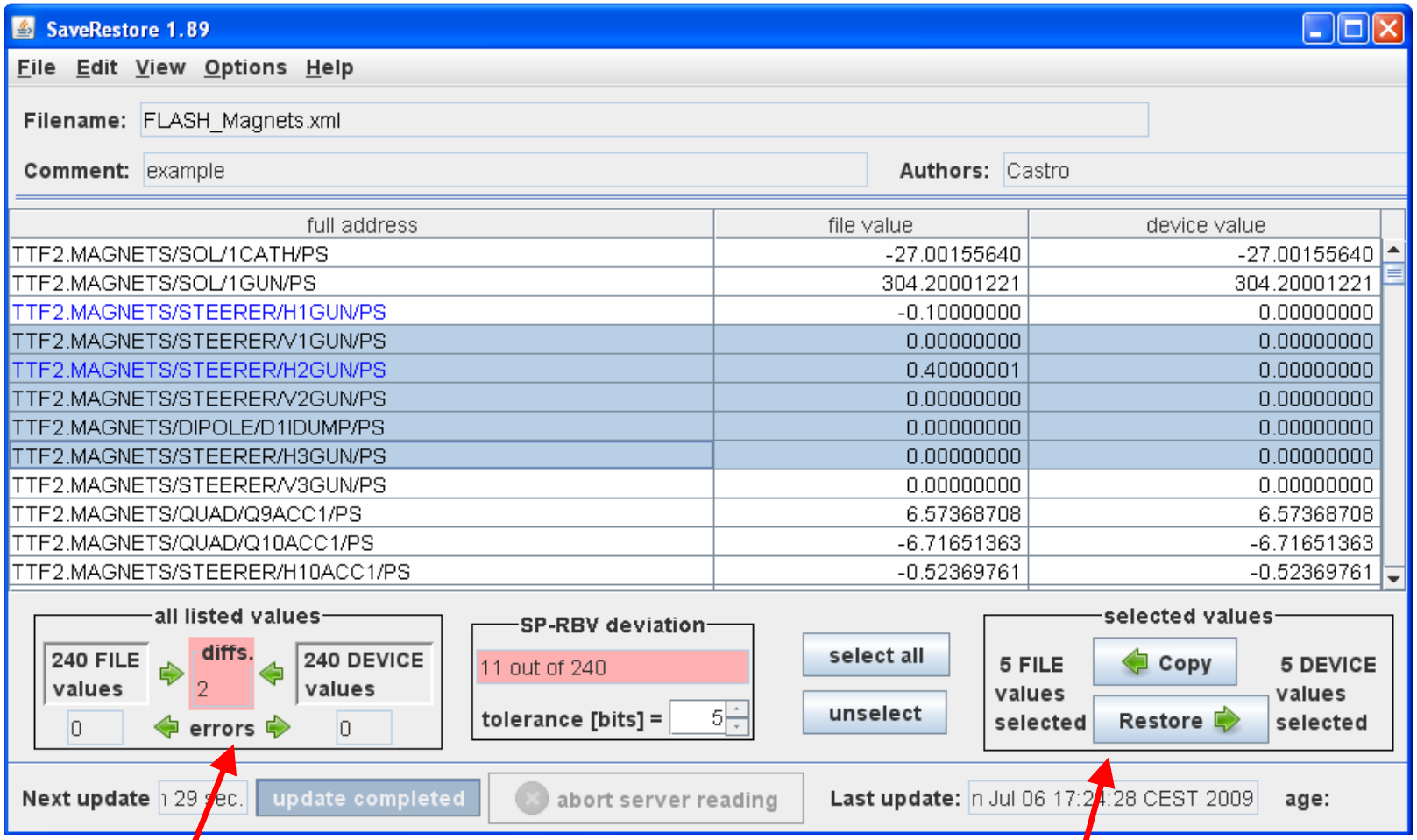
== TTF2.MAGNETS/QUAD/Q3UBC2/PS 34.5562 34.5562
== TTF2.MAGNETS/DIPOLE/D1BC2/PS 61.5994 61.5994
== TTF2.MAGNETS/STEERER/H1BC2/PS 0 0
Selected items 0
Different Items: 52
Error #: 0
All items
INT Format
Selected set to:
Restore all
Edit...
dec
Selected delete
Selected Save: Actual -> Ref.
Selected Restore: Actual <- Ref.
Clear list
Show array
Copy to devices with merge address: ///
Selected Ref->Dev
All Ref->Dev
Save to file
Help
Comparison accuracy (float only): 4
Scaling factor: 1.0
Selected Rescale: Act.
Selected Rescale: Ref.
counters
actions

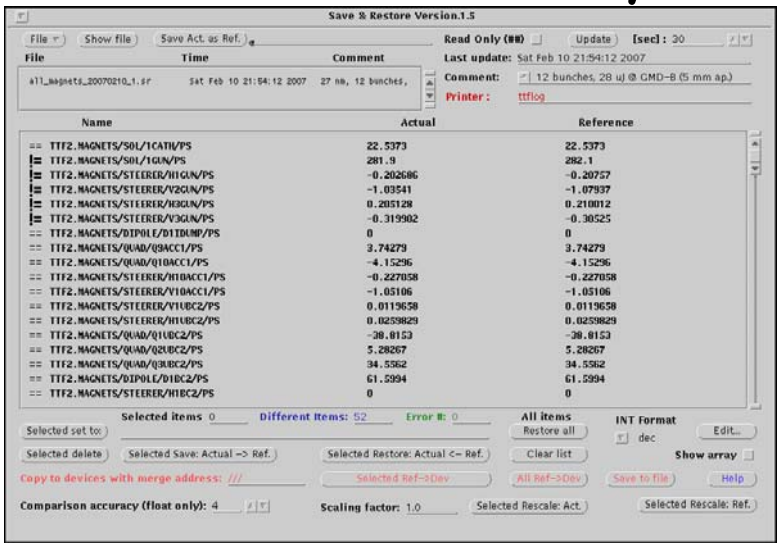


counters

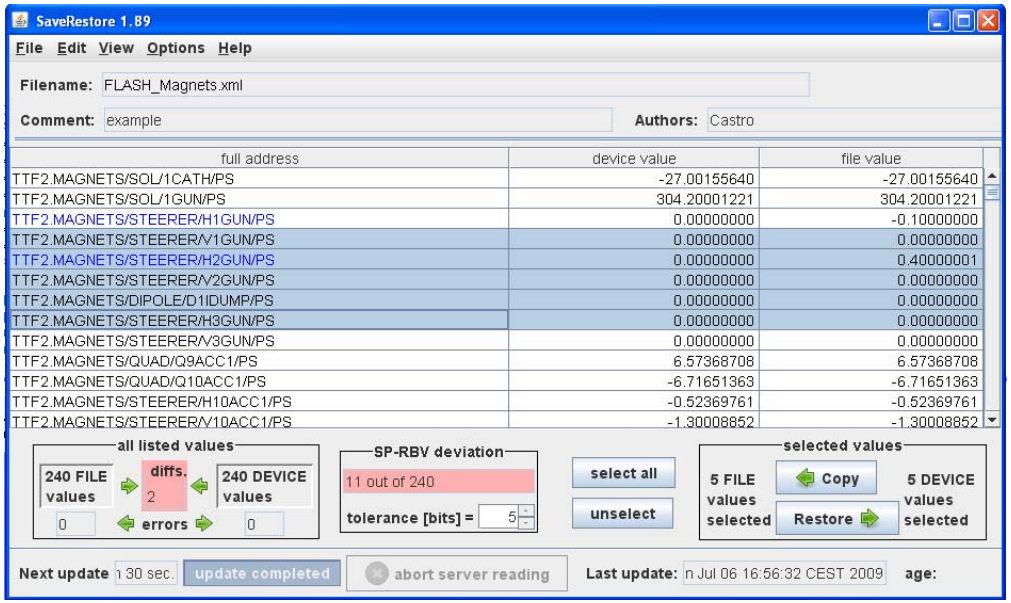
actions

Difference ! Selecting items

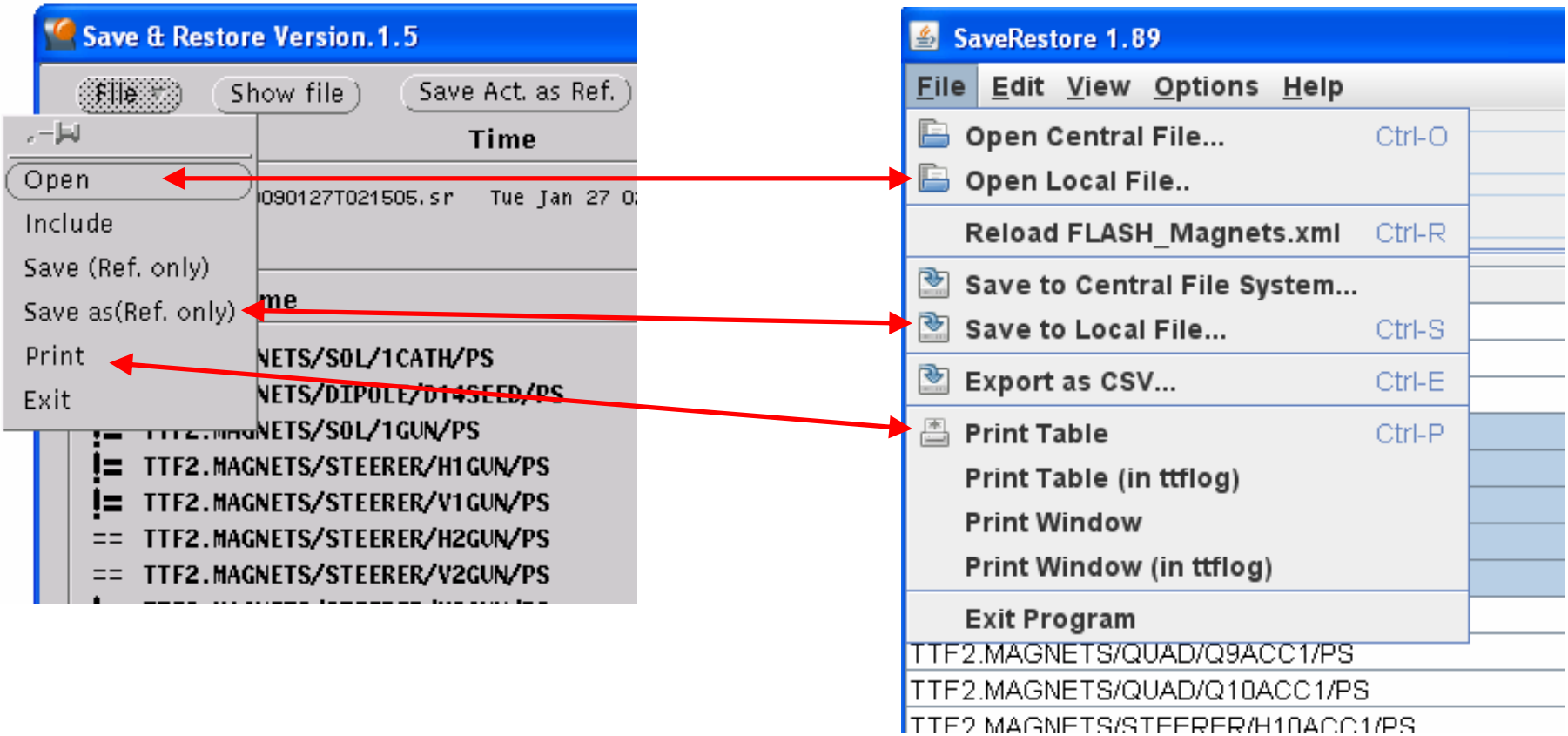
select items one by one



select items as in EXCEL:
multiple selections
with "shift" and "control"



Open/Save/Print



"Central file": is a file repository

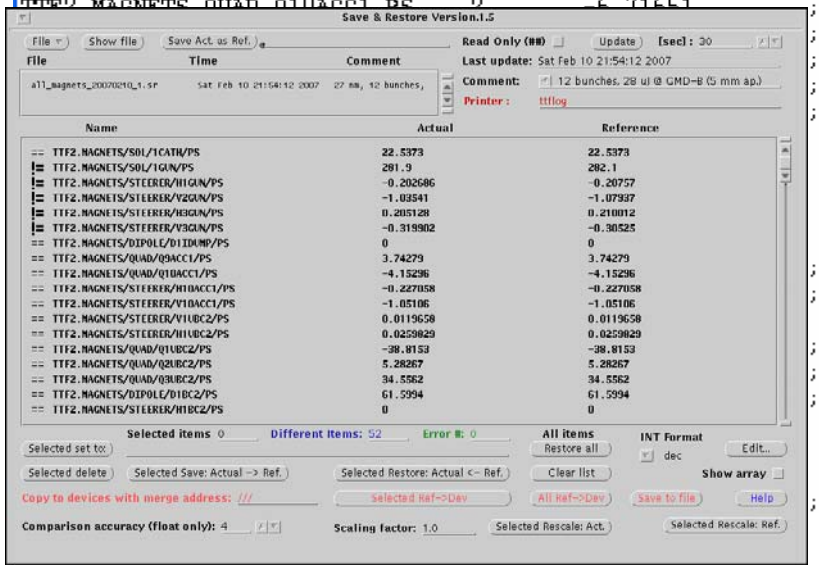
"CSV": "comma-separated values" format

new version can read old Save&Restore format

Difference ! file format

3-column format

```
//Save_&_Restore//
 <Logbook: ttflog > autosaved ;
 Mon Jul  6 14:00:30 2009
 ;
TTF2.MAGNETS SOL 1CATH PS        2        -27.0016        ;
TTF2.MAGNETS DIPOLE D14SEED PS   2        0       ;
TTF2.MAGNETS SOL 1GUN PS         2        304.2   ;
TTF2.MAGNETS STEERER H1GUN PS    2        0       ;
TTF2.MAGNETS STEERER V1GUN PS    2        0       ;
TTF2.MAGNETS STEERER H2GUN PS    2        0       ;
TTF2.MAGNETS STEERER V2GUN PS    2        0       ;
TTF2.MAGNETS STEERER H3GUN PS    2        0       ;
TTF2.MAGNETS STEERER V3GUN PS    2        0       ;
TTF2.MAGNETS DIPOLE D1IDUMP PS   2        0       ;
TTF2.MAGNETS QUAD Q9ACC1 PS      2        6.57369 ;
```



XML formal

```
<machineStatusFile>
  <header>
    <filename>FLASH_Magnets.xml</filename>
    <timestamp>2009-07-06T16:32:26+02</timestamp>
    <comment>example</comment>
    <author>Castro</author>
    <systemSet>Dummy</systemSet>
  </header>
  <listOfData>
    <data addr="TTF2.MAGNETS/SOL/1CATH/PS" type="FLOAT" error="0" write="1" ampsPerBit="BITS2AMPS" rbv="PS.RBV"
    <data addr="TTF2.MAGNETS/SOL/1GUN/PS" type="FLOAT" error="0" write="1" ampsPerBit="BITS2AMPS" rbv="PS.RBV"
    <data addr="TTF2.MAGNETS/STEERER/H1GUN/PS" type="FLOAT" error="0" write="1" ampsPerBit="BITS2AMPS" rbv="PS.
    <data addr="TTF2.MAGNETS/STEERER/V1GUN/PS" type="FLOAT" error="0" write="1" ampsPerBit="BITS2AMPS" rbv="PS.
    <data addr="TTF2.MAGNETS/STEERER/H2GUN/PS" type="FLOAT" error="0" write="1" ampsPerBit="BITS2AMPS" rbv="PS.
    <data addr="TTF2.MAGNETS/STEERER/V2GUN/PS" type="FLOAT" error="0" write="1" ampsPerBit="BITS2AMPS" rbv="PS.
    <data addr="TTF2.MAGNETS/DIPOLE/D1IDUMP/PS" type="FLOAT" error="0" write="1" ampsPerBit="BITS2AMPS" rbv="PS
    <data addr="TTF2.MAGNETS/STEERER/H3GUN/PS" type="FLOAT" error="0" write="1" ampsPerBit="BITS2AMPS" rbv="PS.
    <data addr="TTF2.MAGNETS/STEERER/V3GUN/PS" type="FLOAT" error="0" write="1" ampsPerBit="BITS2AMPS" rbv="PS.
    <data addr="TTF2.MAGNETS/QUAD/Q9ACC1/PS" type="FLOAT" error="0" write="1" ampsPerBit="BITS2AMPS" rbv="PS.RE
    <data addr="TTF2.MAGNETS/QUAD/Q10ACC1/PS" type="FLOAT" error="0" write="1" ampsPerBit="BITS2AMPS" rbv="PS.F
    <data addr="TTF2.MAGNETS/STEERER/H10ACC1/PS" type="FLOAT" error="0" write="1" ampsPerBit="BITS2AMPS" rbv="F
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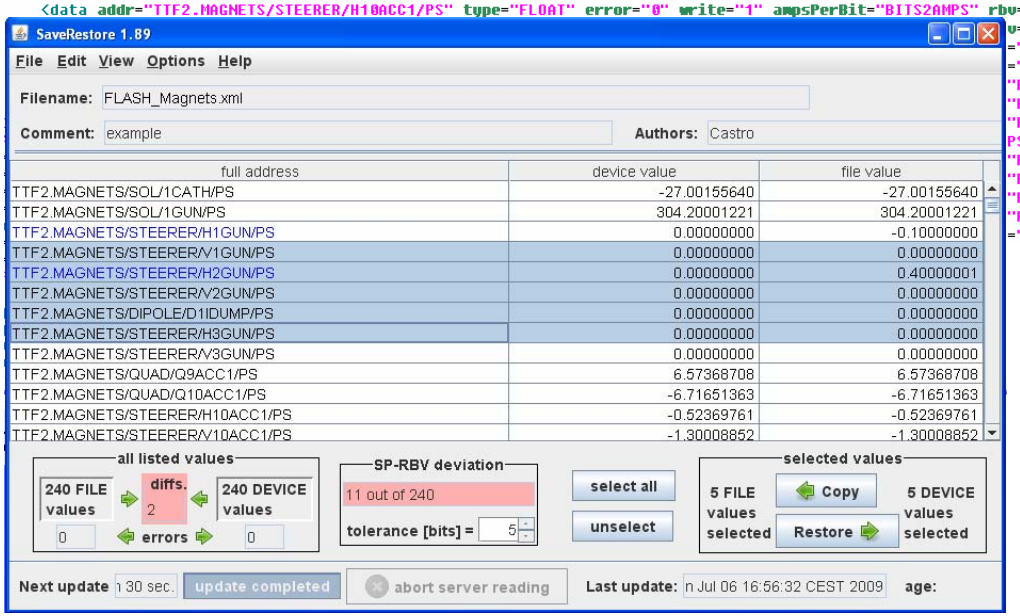
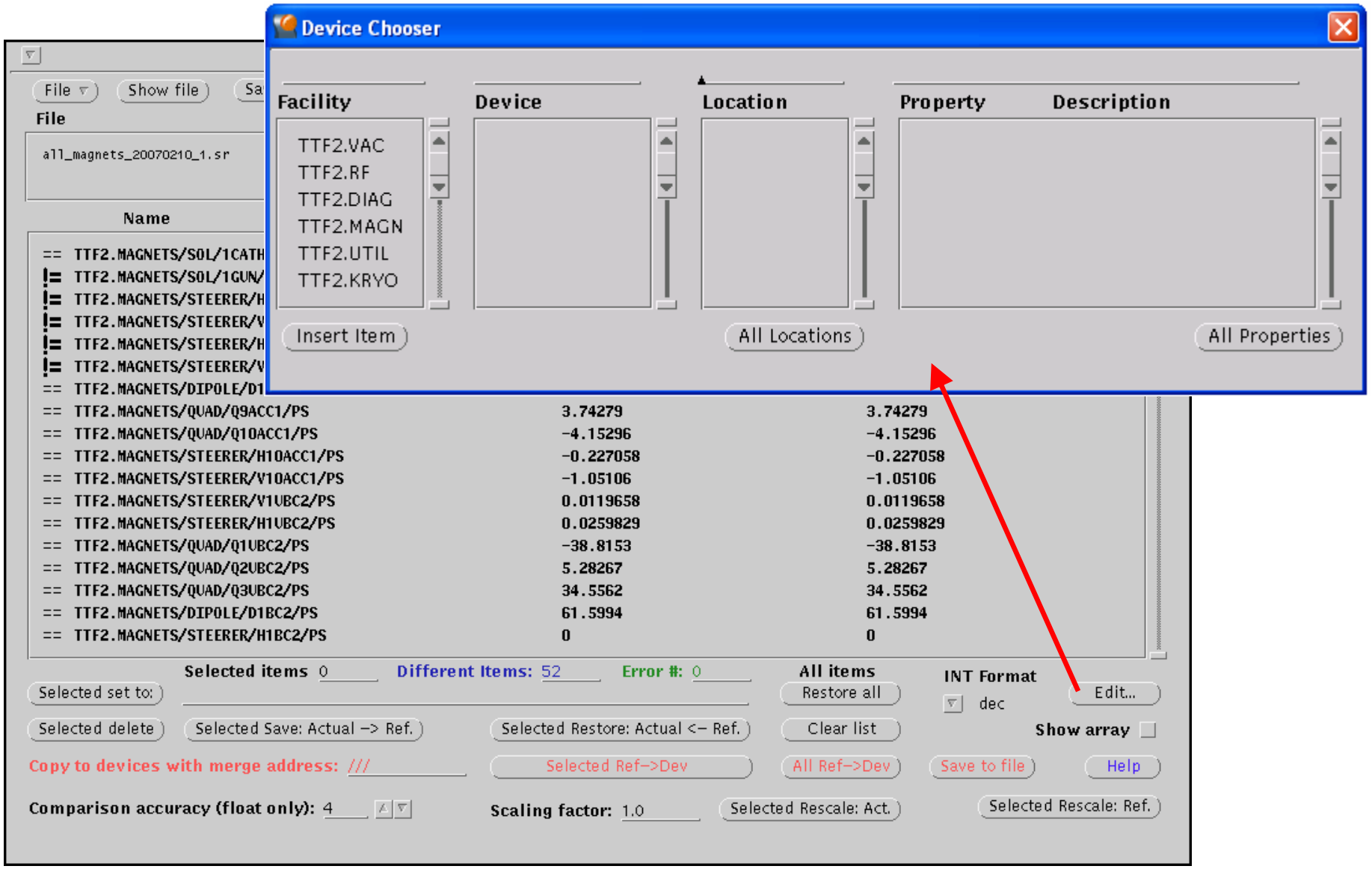
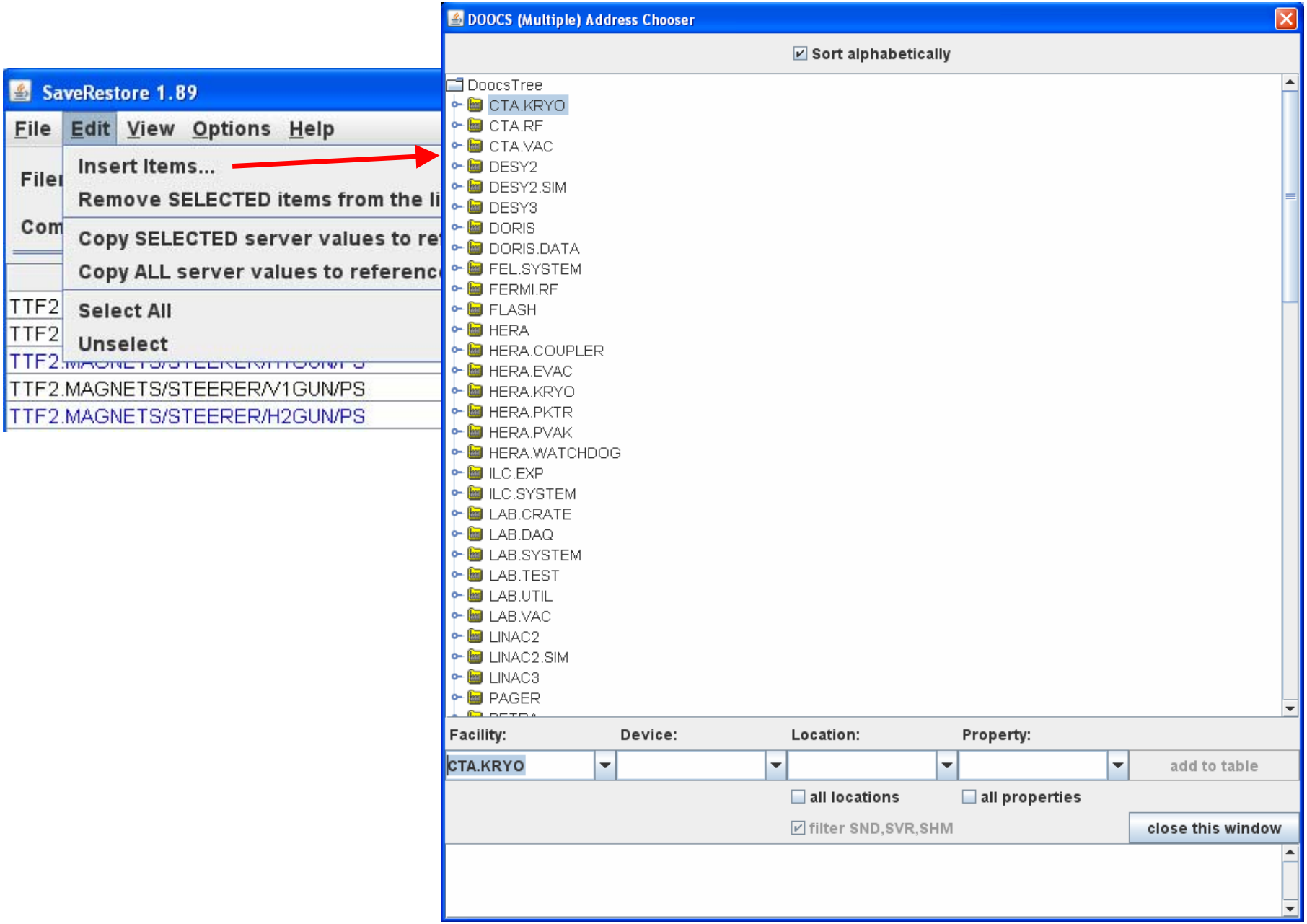


Less used features:

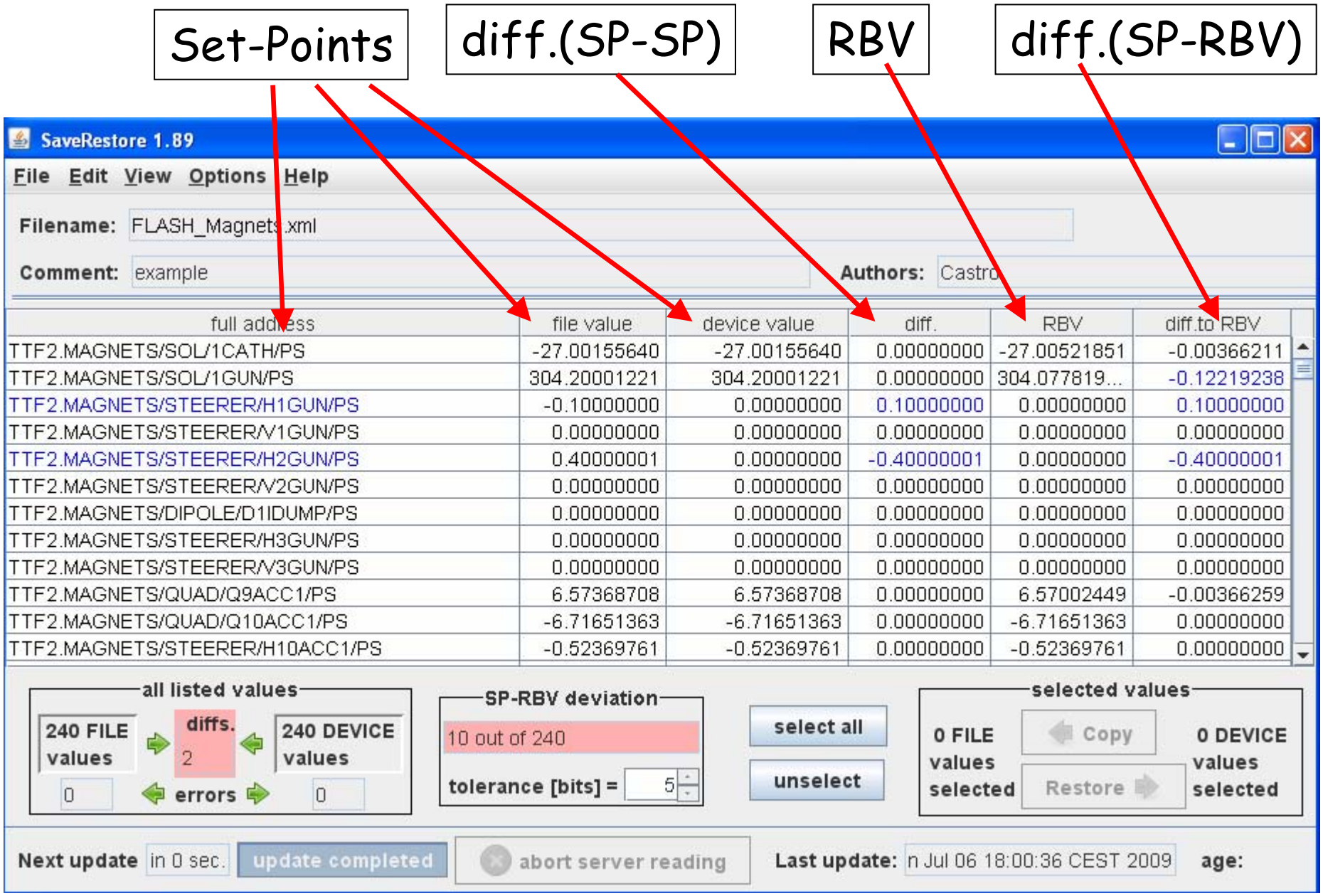
insert new address



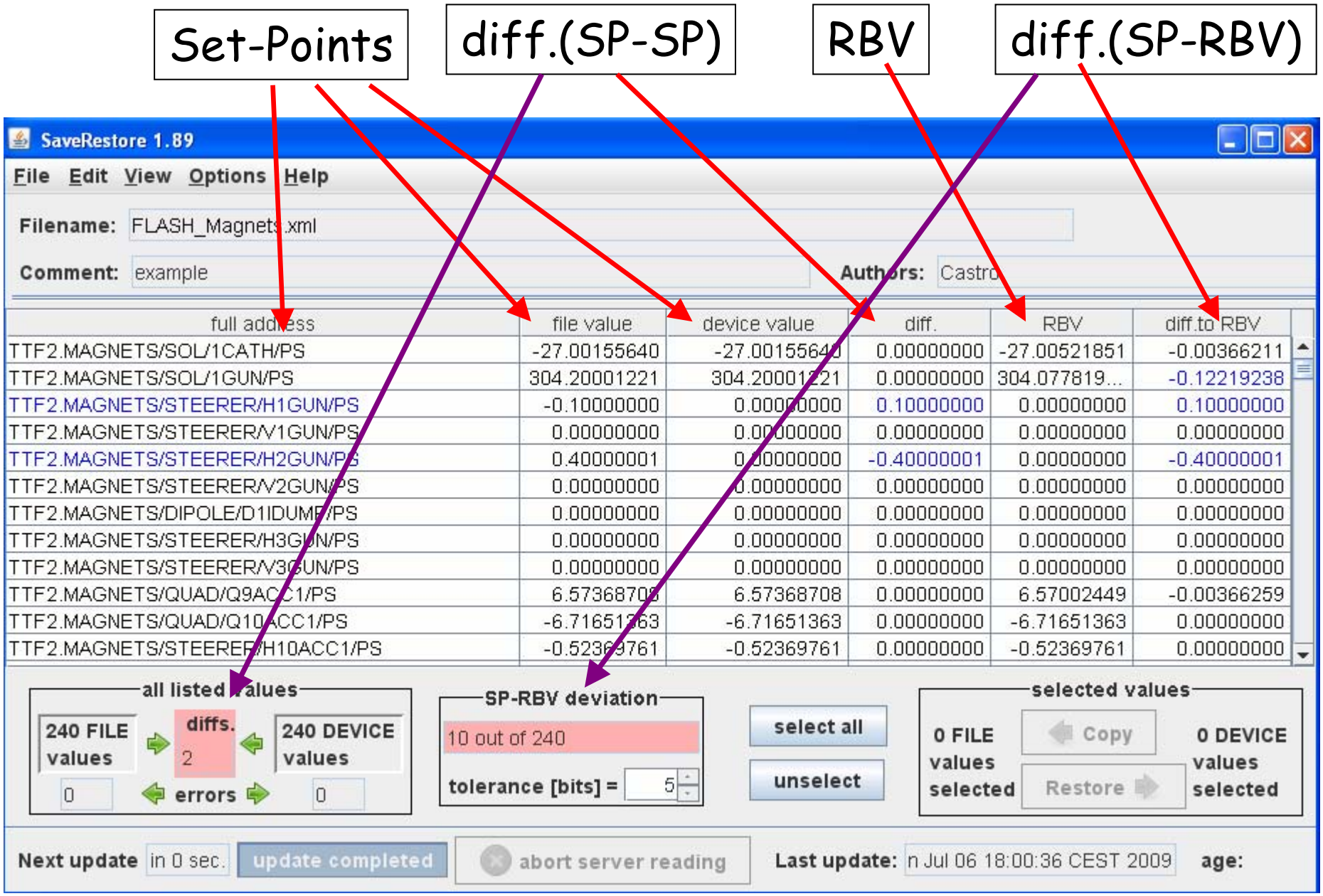
Less used features: insert new address



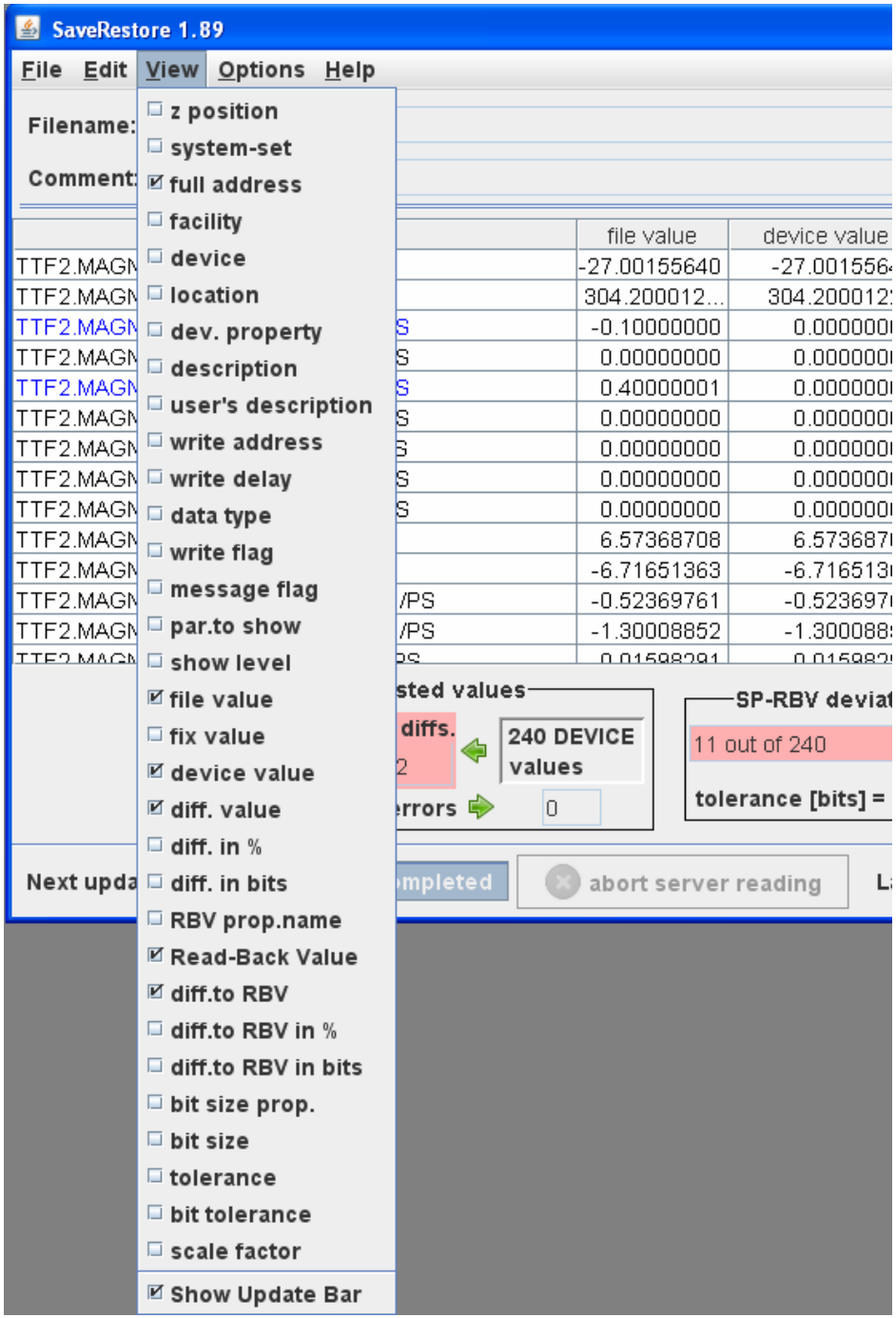
More extras (for magnet power supplies):



More extras (for magnet power supplies):

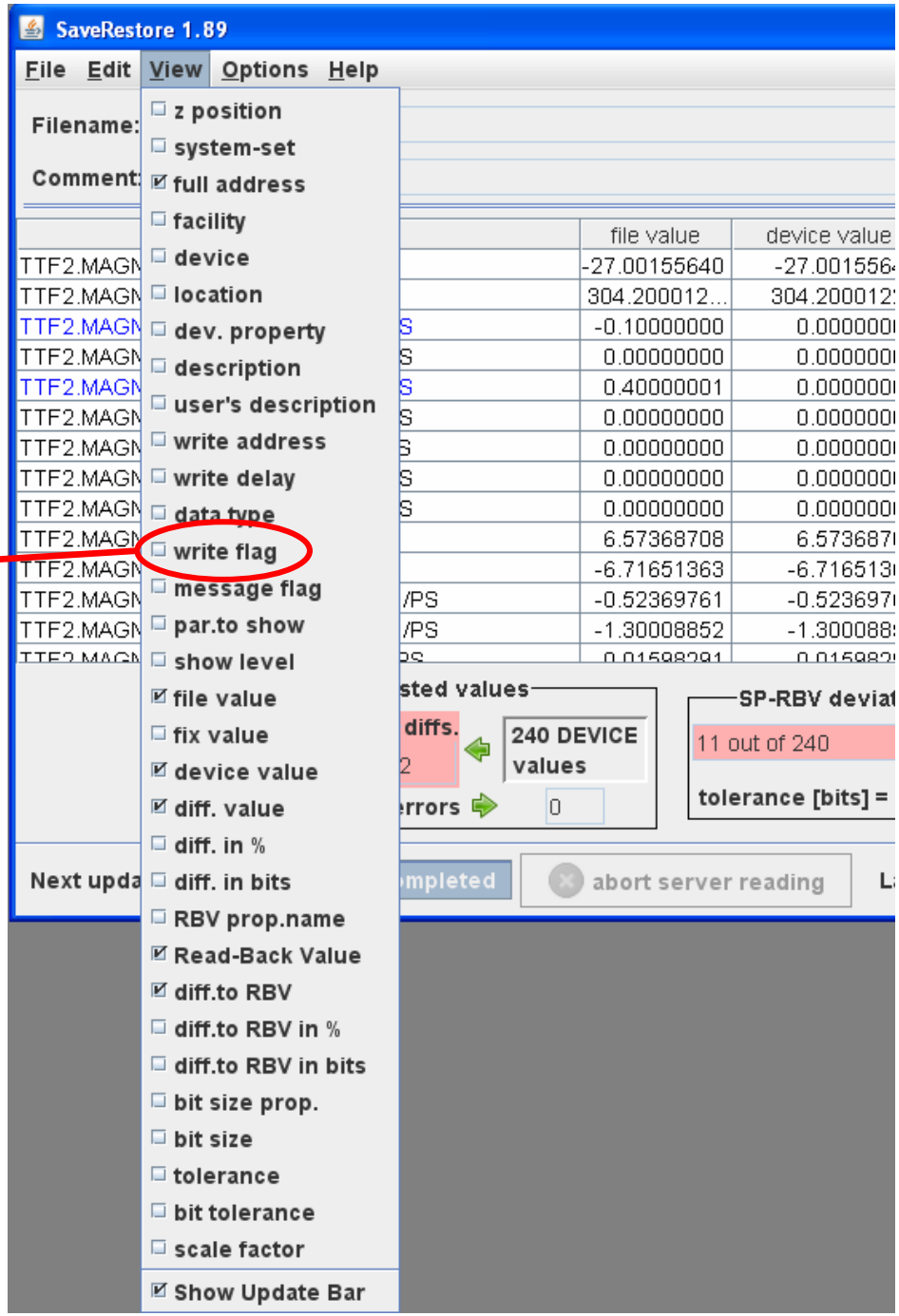


More extras:


SaveRestore 1.89
File
Edit
View
Options
Help
Filename:
Comment:
z position
system-set
full address
facility
device
location
dev. property
description
user's description
write address
write delay
data type
write flag
message flag
par.to show
show level
file value
fix value
device value
diff. value
diff. in %
diff. in bits
RBV prop.name
Read-Back Value
diff.to RBV
diff.to RBV in %
diff.to RBV in bits
bit size prop.
bit size
tolerance
bit tolerance
scale factor
Show Update Bar
file value
device value
TTF2.MAGN
-27.00155640
304.200012...
-0.10000000
0.00000000
0.40000001
0.00000000
0.00000000
0.00000000
0.00000000
6.57368708
-6.71651363
-0.52369761
-1.30008852
sted values
diffs.
240 DEVICE values
errors
0
SP-RBV deviat
11 out of 240
tolerance [bits] =
Next upda
mpleted
abort server reading

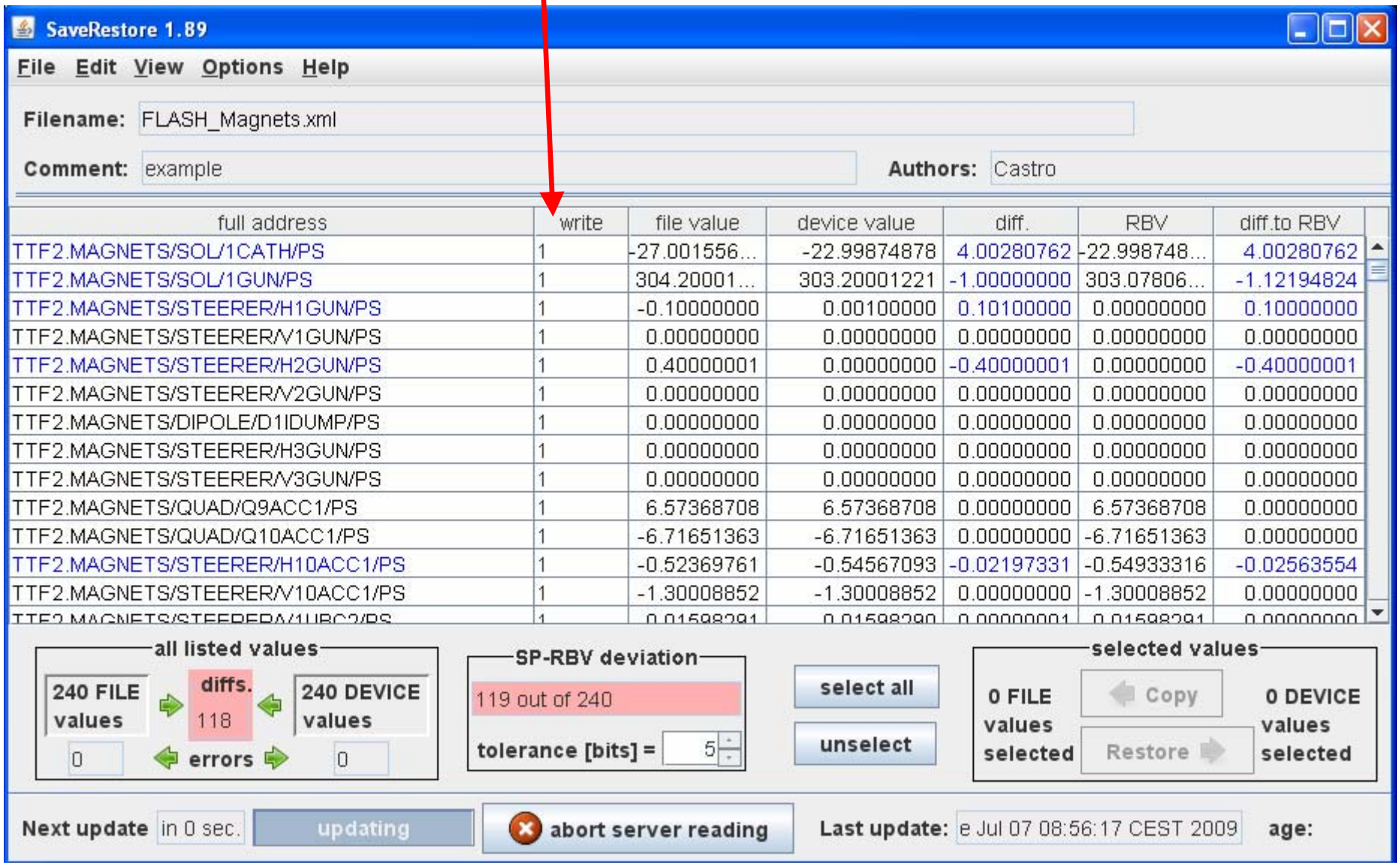
More extras:

'write' flag

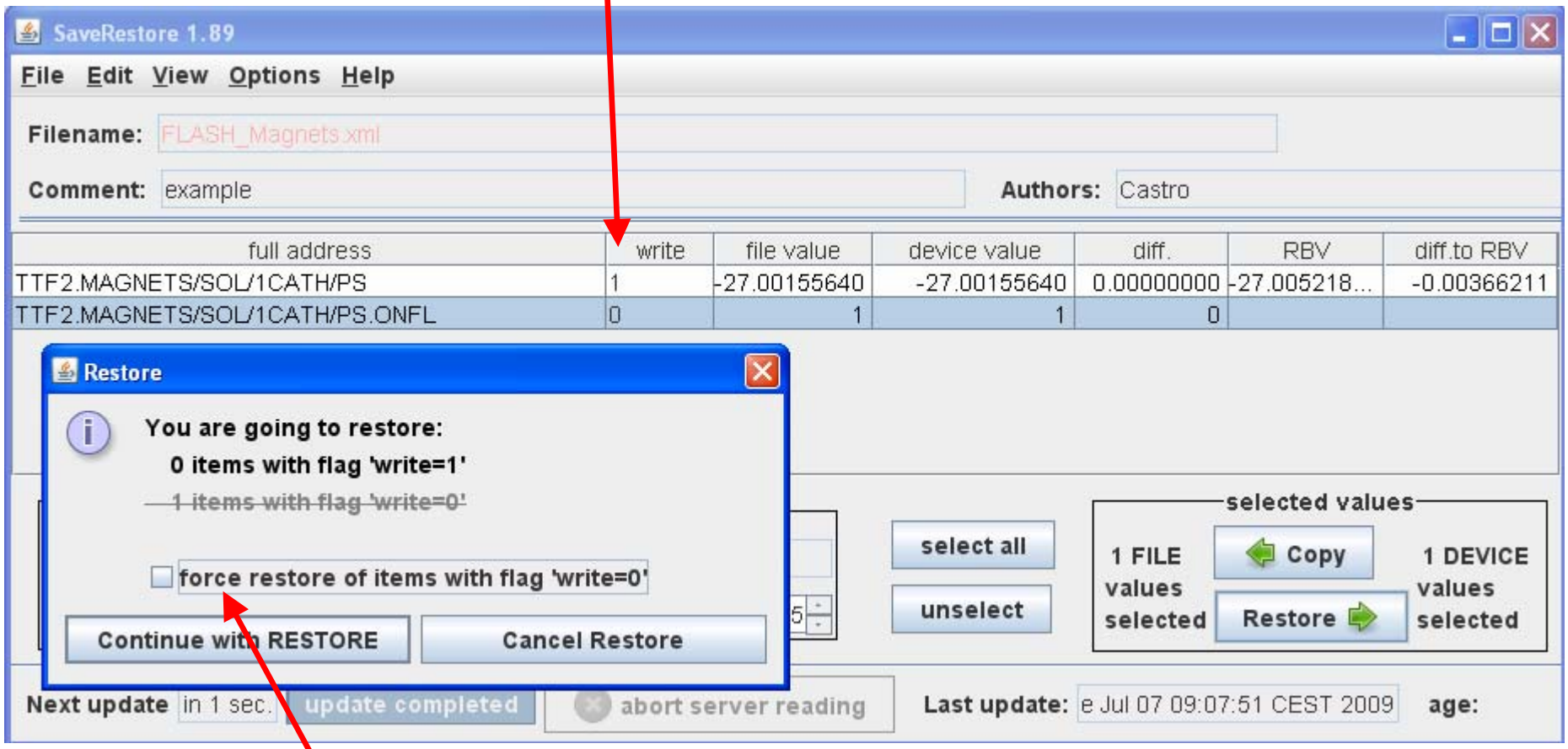


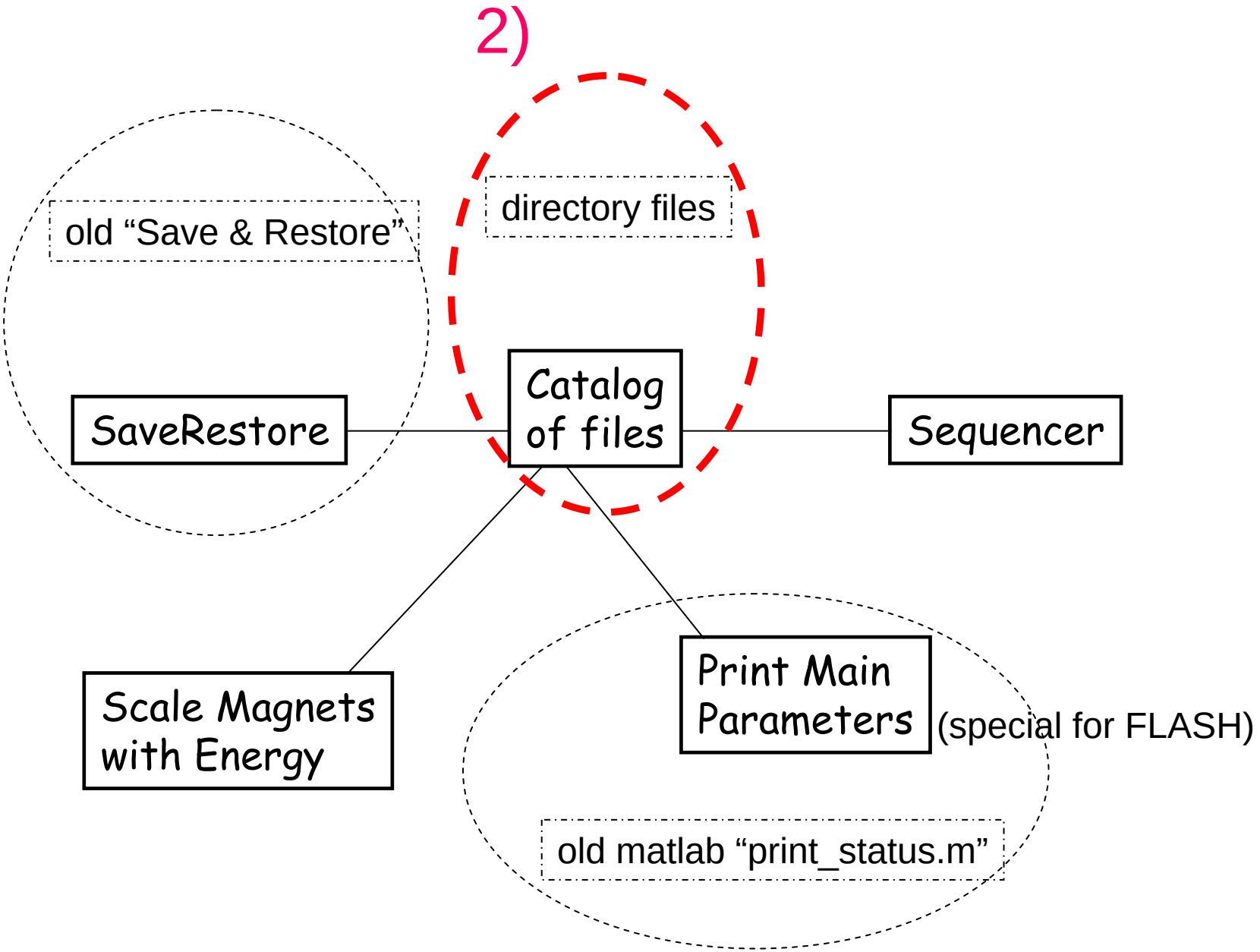
More extras:

'write' flag



'write' flag


SaveRestore 1.89
File Edit View Options Help
Filename: FLASH_Magnets.xml
Comment: example
Authors: Castro
full address
write
file value
device value
diff.
RBV
diff.to RBV
TTF2.MAGNETS/SOL/1CATH/PS
1
-27.00155640
-27.00155640
0.00000000
-27.005218...
-0.00366211
TTF2.MAGNETS/SOL/1CATH/PS.ONFL
0
1
1
0
Restore
You are going to restore:
0 items with flag 'write=1'
1 items with flag 'write=0'
force restore of items with flag 'write=0'
Continue with RESTORE
Cancel Restore
select all
unselect
selected values
1 FILE values selected
Copy
Restore
1 DEVICE values selected
Next update
in 1 sec.
update completed
abort server reading
Last update:
e Jul 07 09:07:51 CEST 2009
age:


2)
old “Save & Restore”
directory files
SaveRestore
Catalog of files
Sequencer
Scale Magnets with Energy
Print Main Parameters
(special for FLASH)
old matlab “print_status.m”

2) list of files:

```
all_Magnets_20090630T223559.sr
all_Magnets_20090701T070233.sr
all_Magnets_20090701T150617.sr
all_Magnets_20090701T230734.sr
all_Magnets_20090702T070211.sr
all_Magnets_20090702T094950.sr
all_Magnets_20090702T104927.sr
all_Magnets_20090702T150644.sr
all_Magnets_20090702T155050.sr
all_Magnets_20090702T230113.sr
all_Magnets_20090703T071006.sr
all_Magnets_20090703T143030.sr
all_Magnets_20090703T174617.sr
all_Magnets_20090703T230946.sr
all_Magnets_20090704T095502.sr
all_Magnets_20090704T111749.sr
all_Magnets_20090706T011803.sr
all_Magnets_20090706T080403.sr
all_Magnets_20090706T085150.sr
all_Magnets_20090706T113340.sr
all_Magnets_20090706T115920.sr
all_Magnets_20090706T140011.sr
all_Magnets_20090706T143551.sr
all_Magnets_20090706T151837.sr
all_Magnets_20090706T230509.sr
all_Magnets_20090707T070750.sr
all_magnets20080413T0858.sr
all_magnets20090627T1506.sr
all_magnets_20090630T2256
all_magnets_20090630T2256,sr
all_magnets_20090630T2256.sr
all_magnets_20090630T2351
```

which one is good?

for bypass or for SASE?

which wavelength? how much SASE?

taken with beam?

or

search in e-logbook

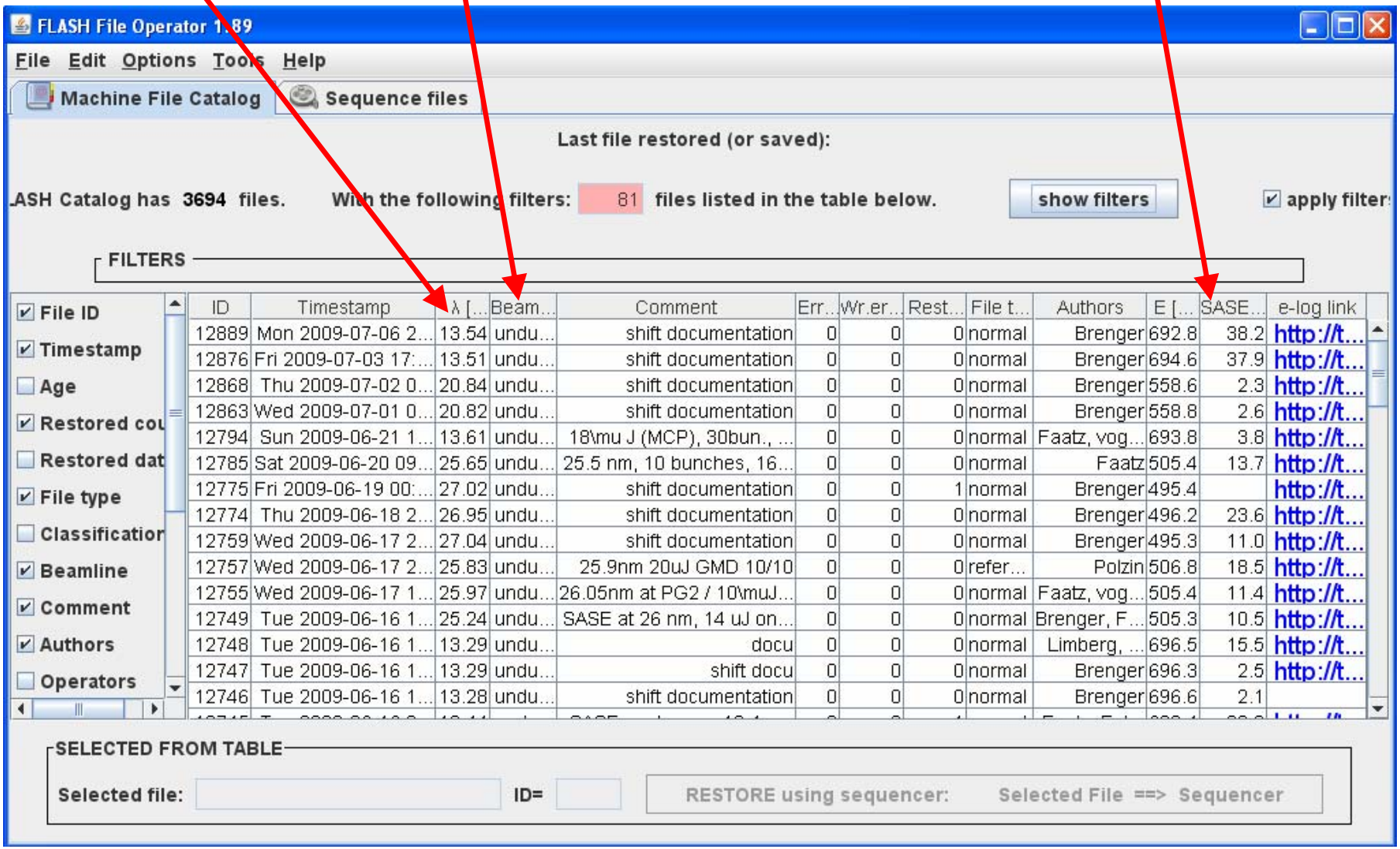
(good luck!)

2) catalog of files:

wavelength

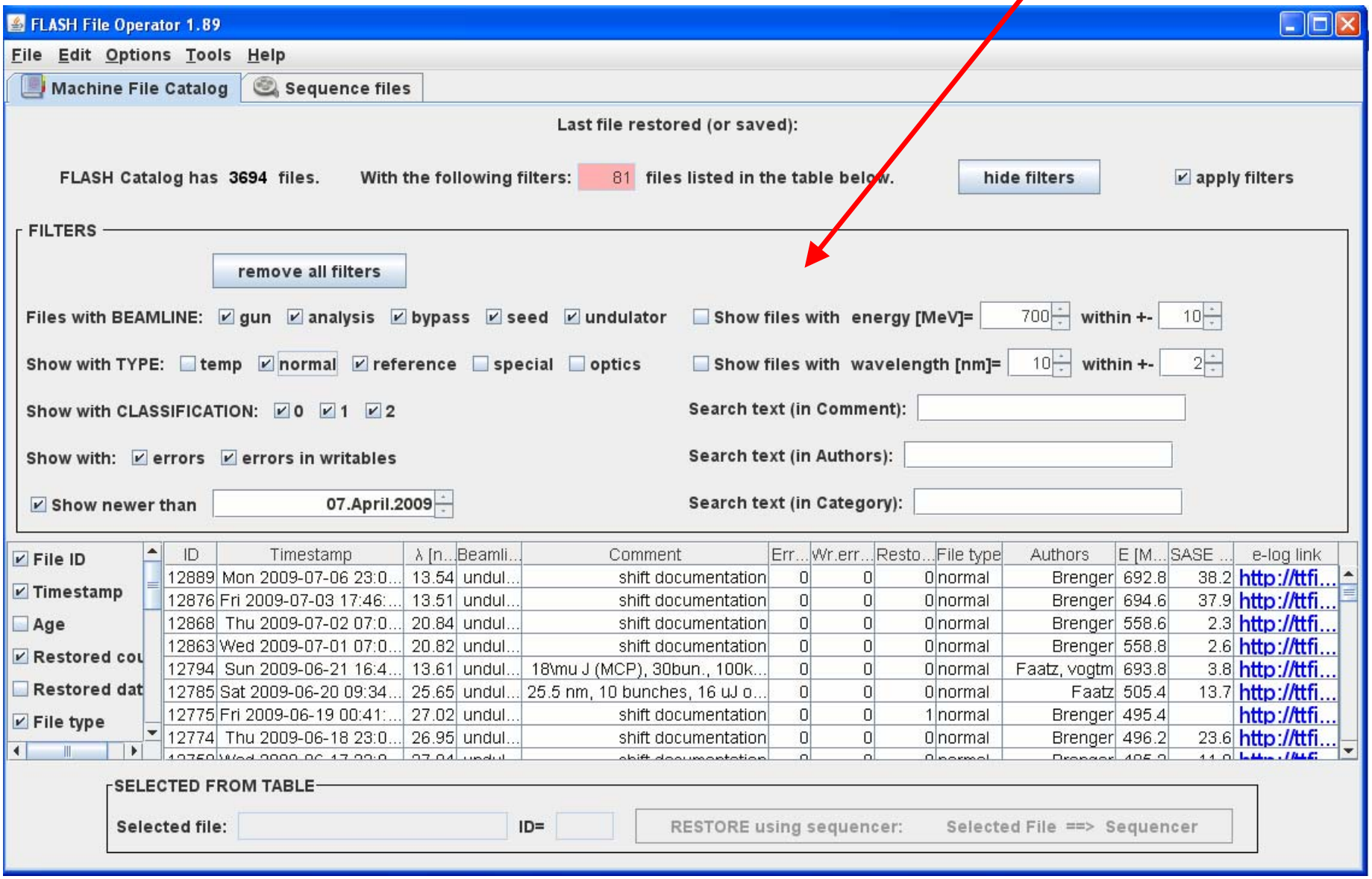
beamline

how much SASE



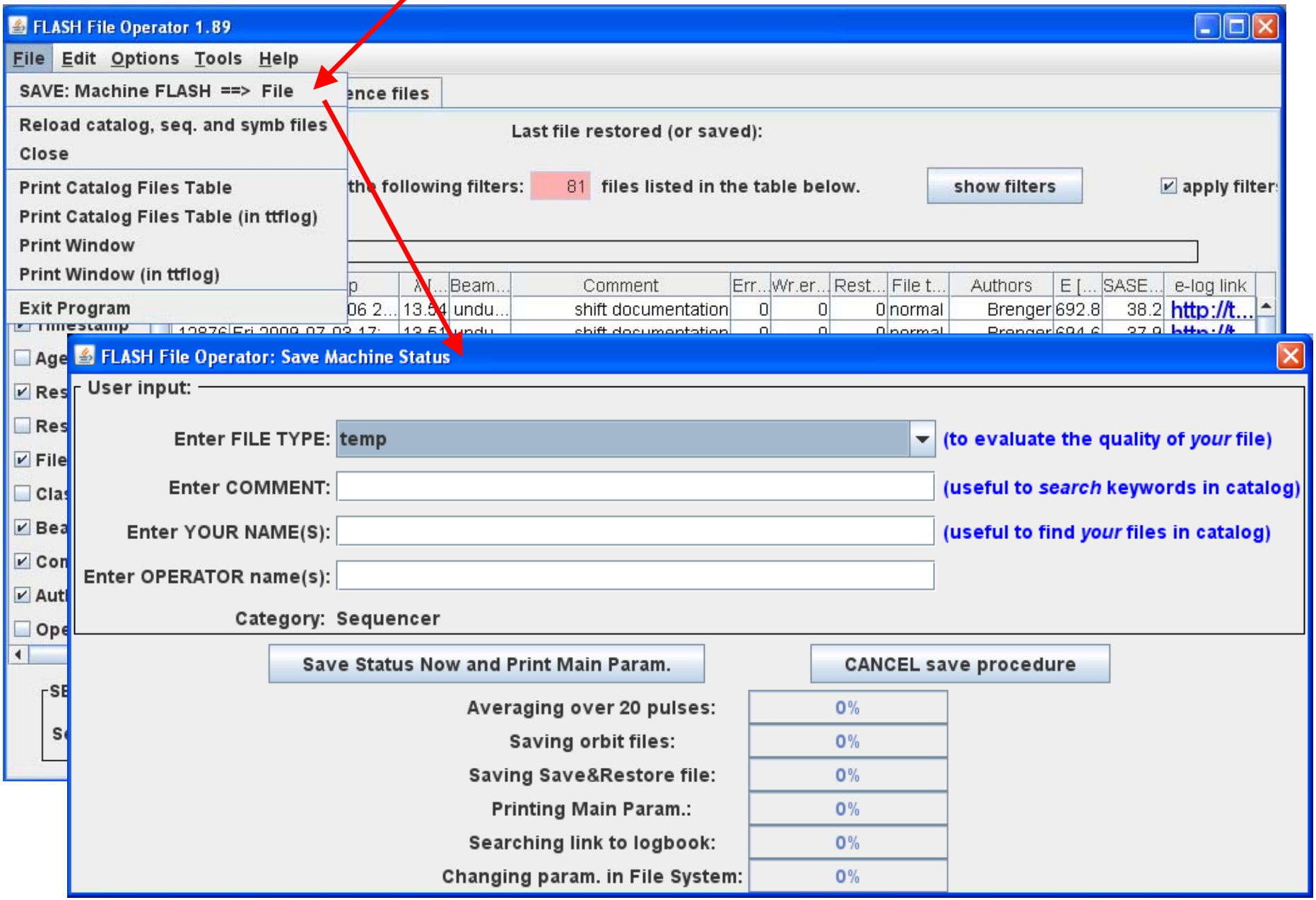
2) catalog of files: how to search:

using the filters



2) catalog of files:

save a new file + print main parameters



2) catalog of files:

print main parameters

only for FLASH

saves magnets
in Save&Restore files

saves orbit for
Orbit Display program

08.03.2007 22:51 ttflinac — Main linac parameters

Laser
Number of bunches 15
Bunch frequency ..... 100 kHz
Macropulse rep'rate .... 5 Hz
Flashlamp current 2
Flashlamp start time ... 2.16 ms
Attenuator SP 5488
Iris diameter ..... 1.95 mm
Piezo Voltage ..... 4.944 V

Gun
Feedforward/Feedback ... on/on
Pfwd SP 3.25
Phase SP ..... -112.68 deg
Pfwd (peak) ..... 3.509 MW
Prefl (peak) ..... 1.711 MW
Pfwd (sample point 700) 3.6264 MW
Prefl (sample point 700) 0.053319 MW
Flat top ..... 200 us
Water temperature SP ... 60.31 deg C
Main solenoid ..... 294.6953 A
Bucking coil ..... 26.0018 A
Gun dipole ..... 0 A
Charge 3GUN(T1) ..... 0.91614 nC

ACC1
Feedforward/Feedback ... on/on
Pfwd SP 15.21
Phase SP 176.9183
Pfwd C1.ACC1 ..... 54.1813 kW
Pfwd C5.ACC1 ..... 251.9692 kW
Flat top ..... 100 us
Beam loading comp. (BLC) off
BLC current/duration ... 0.8 mA/70 us
Dipole BC2 ..... 61.5994 A
Pyro 9DBC2 ..... -0.060908 V
Radiator 9DBC2 ..... open

ACC2/3
DSP trigger rate ..... 5 Hz
Feedforward/Feedback ... on/on
Pfwd SP 21.9
Phase SP 88.7419
Pfwd C5.ACC2 ..... 0.1567 kW
Pfwd C1.ACC3 ..... 0.09197 kW
Flat top ..... 188 us
Beam loading comp. (BLC) off
BLC current/duration ... 0.8 mA/600 us
Dipole BC3 ..... 40.694 A
Pyro 14BC3 ..... -0.097174 V
Pyro 4DBC3 ..... -0.065883 V
Radiator 4DBC3 ..... open

ACC4/5
DSP trigger rate ..... 5 Hz
Feedforward/Feedback ... on/on
Pfwd SP 18.06
Phase SP 178.7218
Pfwd C1.ACC4 ..... 0.05278 kW
Pfwd C2.ACC5 ..... 0.000939 kW
Flat top ..... 185 us
Beam loading comp. (BLC) off
BLC current/duration ... 0.8 mA/660 us

Collimator
Dipole D1ECOL ..... 122.4912 A
Energy dogleg ..... 691.8683 MeV

Bypass
Dipole D1BYP ..... 0 A
Energy bypass ..... 2.6006 MeV

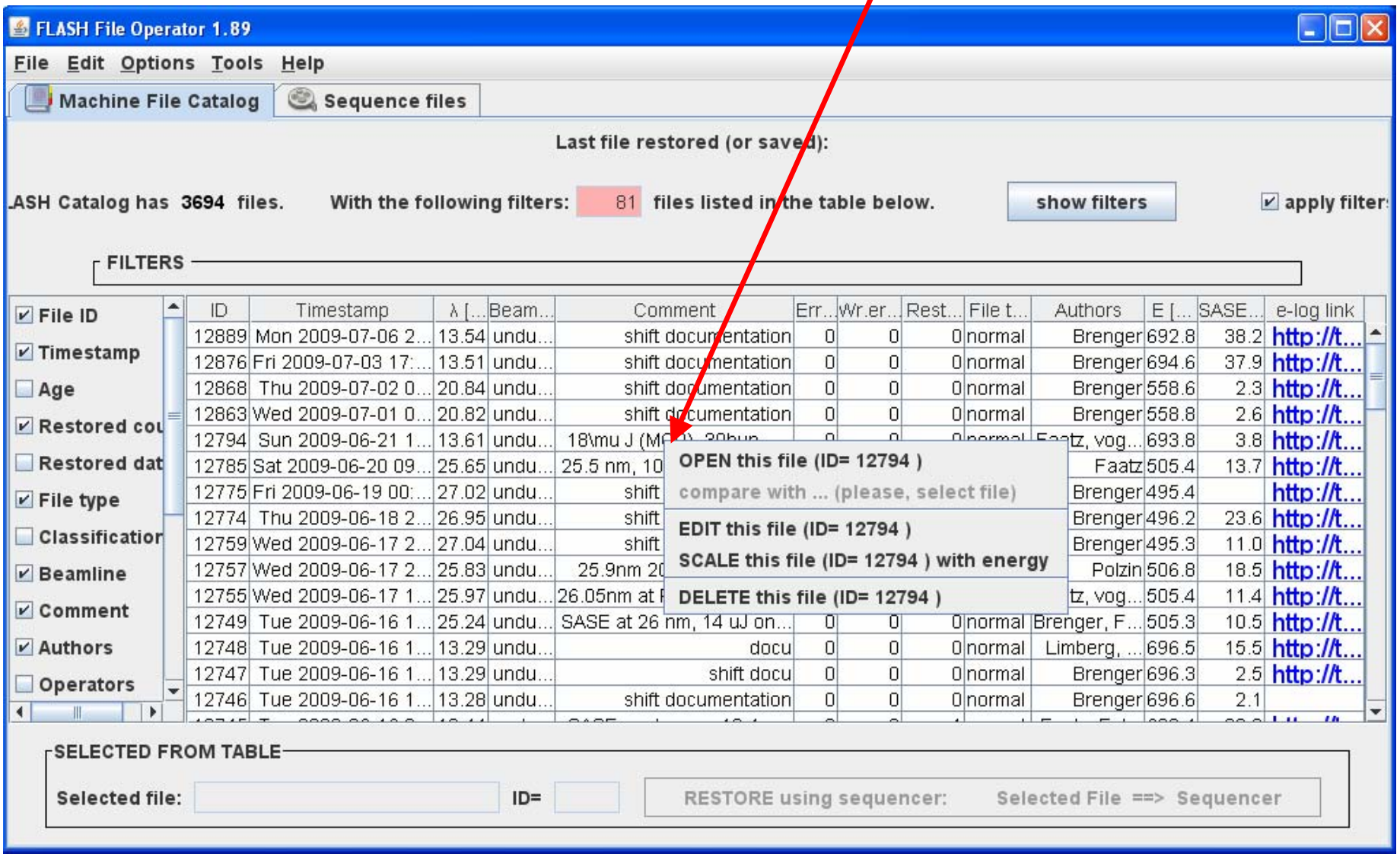
Dump
Dipole D1DUMP ..... 133.5912 A
Dipole D6DUMP ..... 147.0176 A
Radiation level (wall) . 163 counts/ms

Feedbacks
Charge feedback ..... off
Charge feedback SP ..... 0.2 nC
PTO feedback ..... on

Magnets saved to:
/home/ttflinac/save_restore/Magnets/autosaved/all_Magnets_20070308T225118.sr
uMovers saved to:
/home/ttflinac/save_restore/Micromovers/autosaved/uMovers_20070308T225122.sr
Orbit reference saved in
/home/ttflinac/bin/matlab/orbit_stability/2007-03-08T225123-orbit-stability

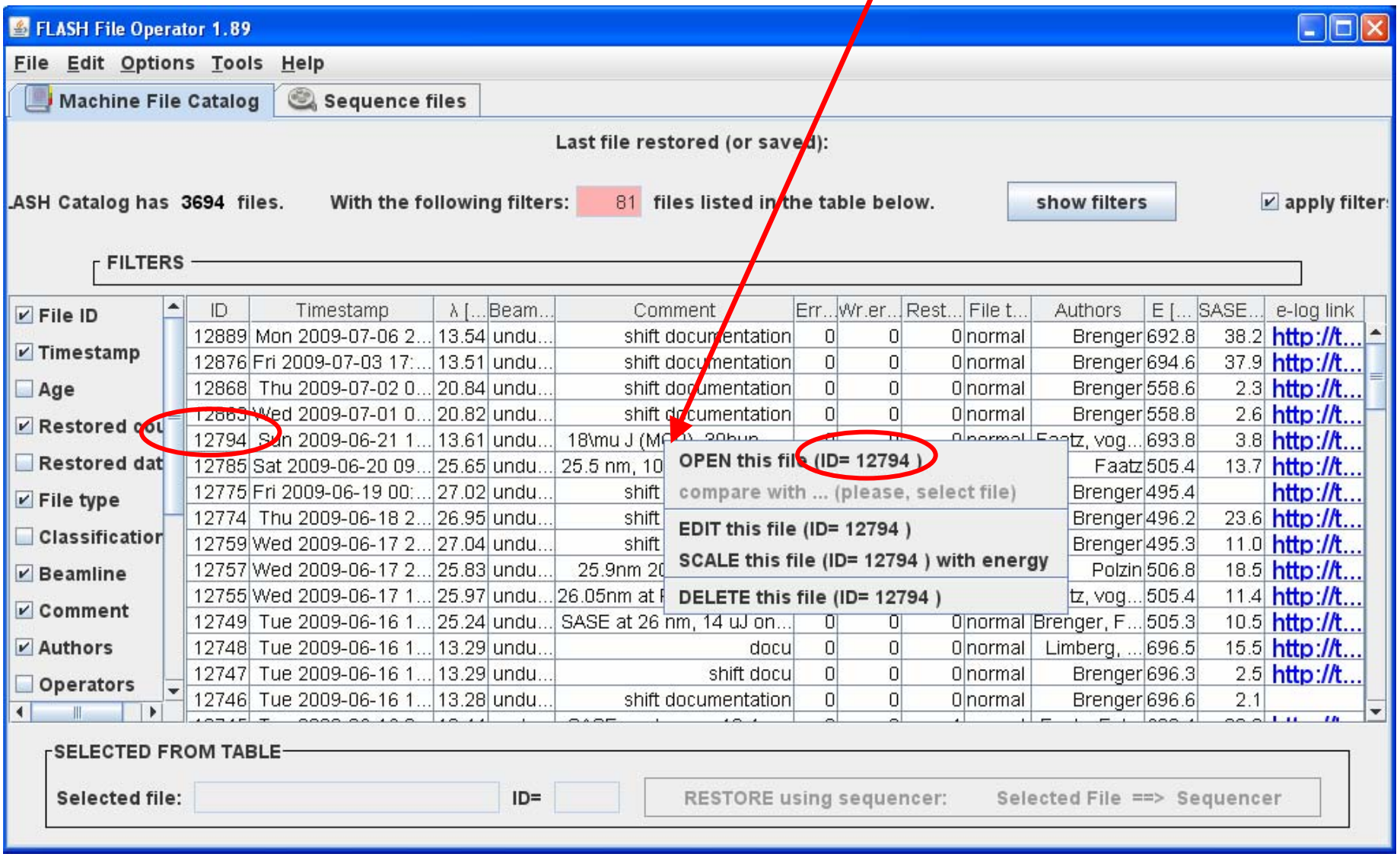
2) catalog of files:

click on right mouse button



2) catalog of files:

click on right mouse button

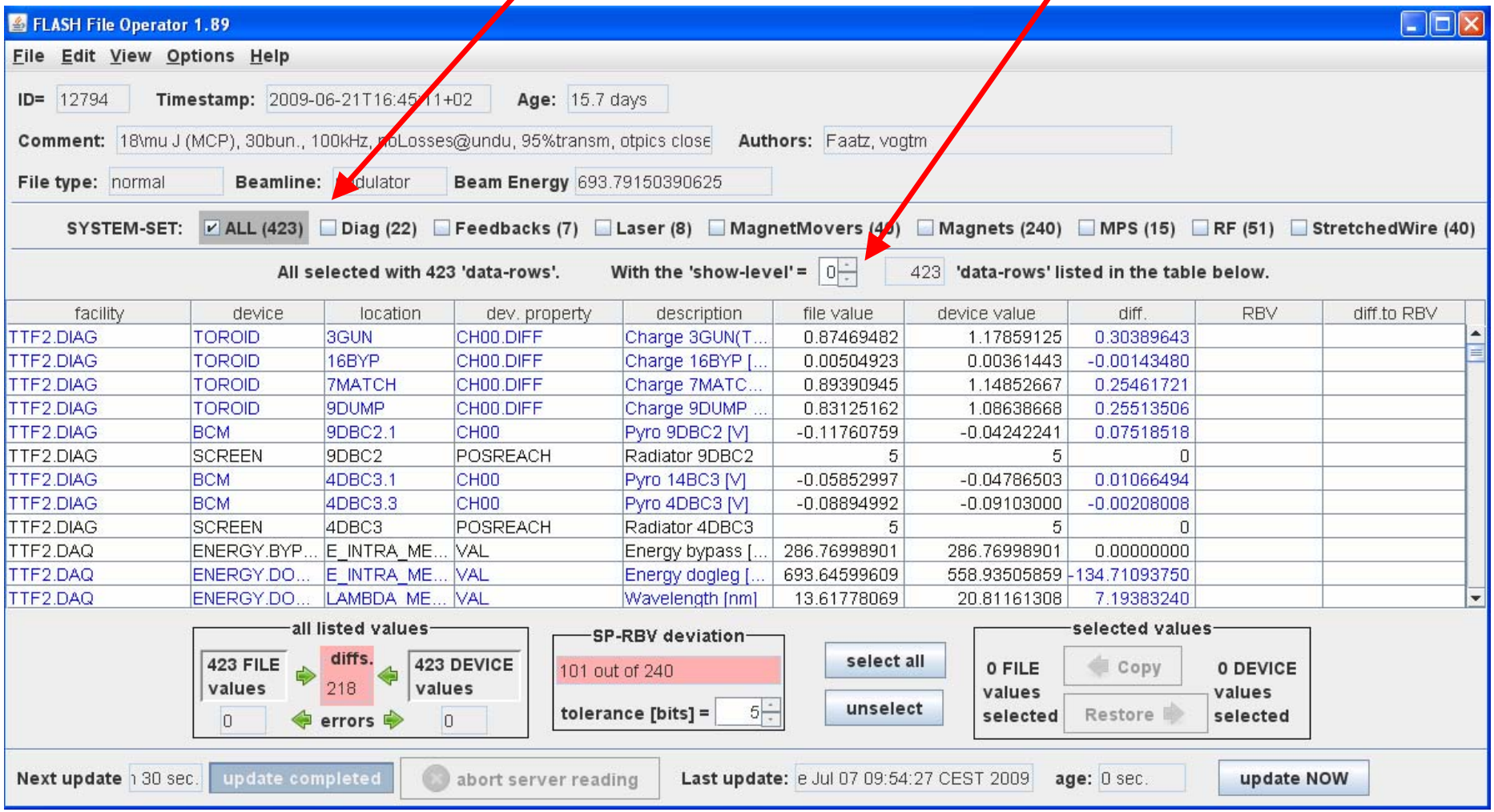


2) catalog of files:

view file in SaveRestore

systems

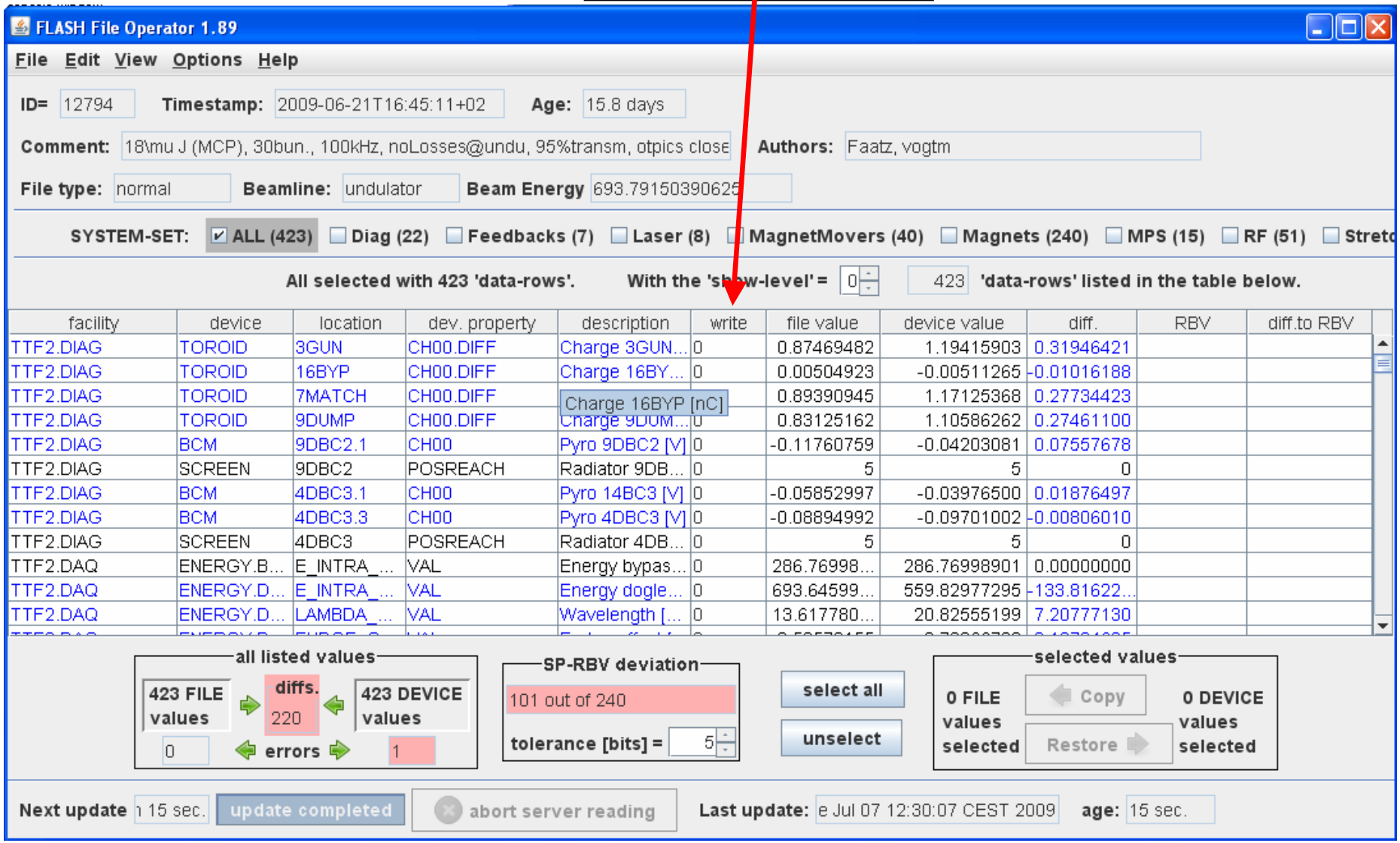
'show' level



'write' flag

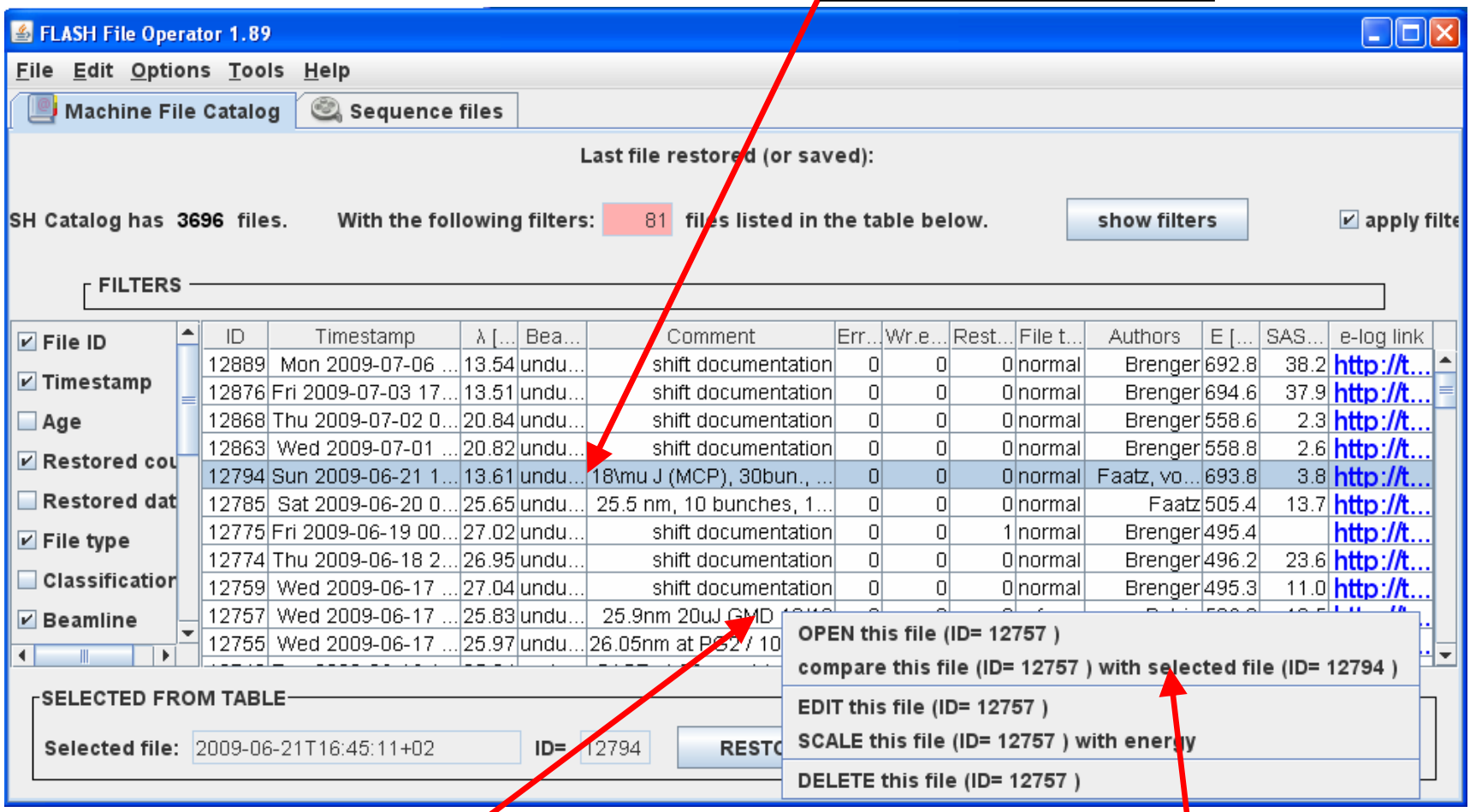
2) catalog of files: view file in SaveRestore

'write' flag



2) catalog of files: compare two files

1. select a file



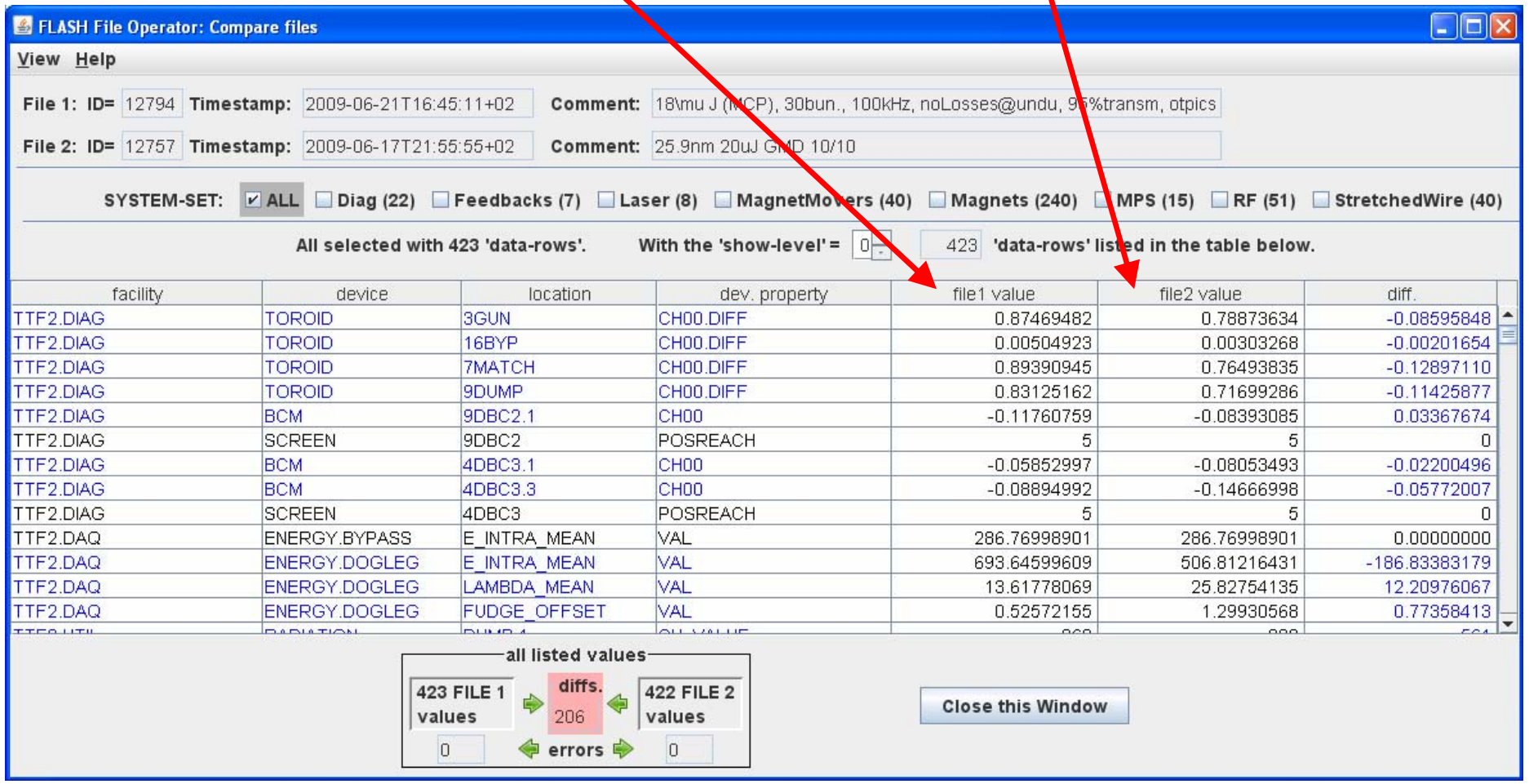
2. click on right mouse button

3. click 'compare'

2) catalog of files: compare two files

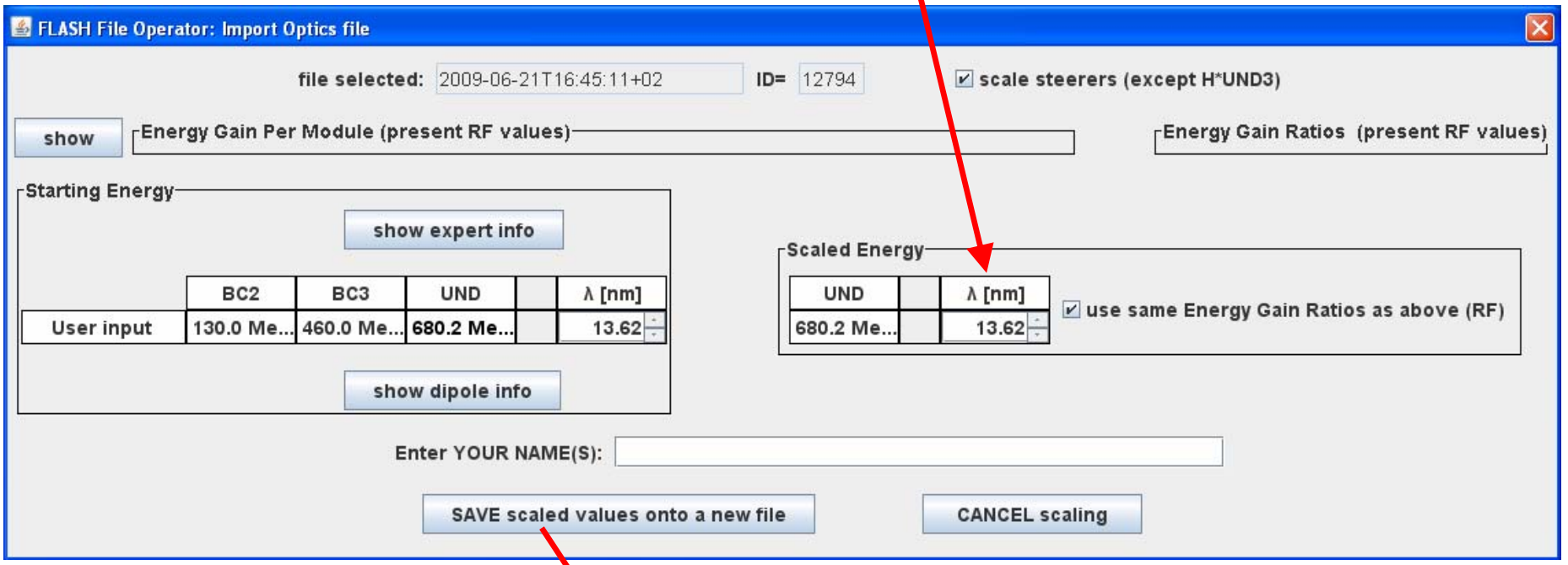
value from file 1

value from file 2



2) catalog of files: scale magnets with energy:

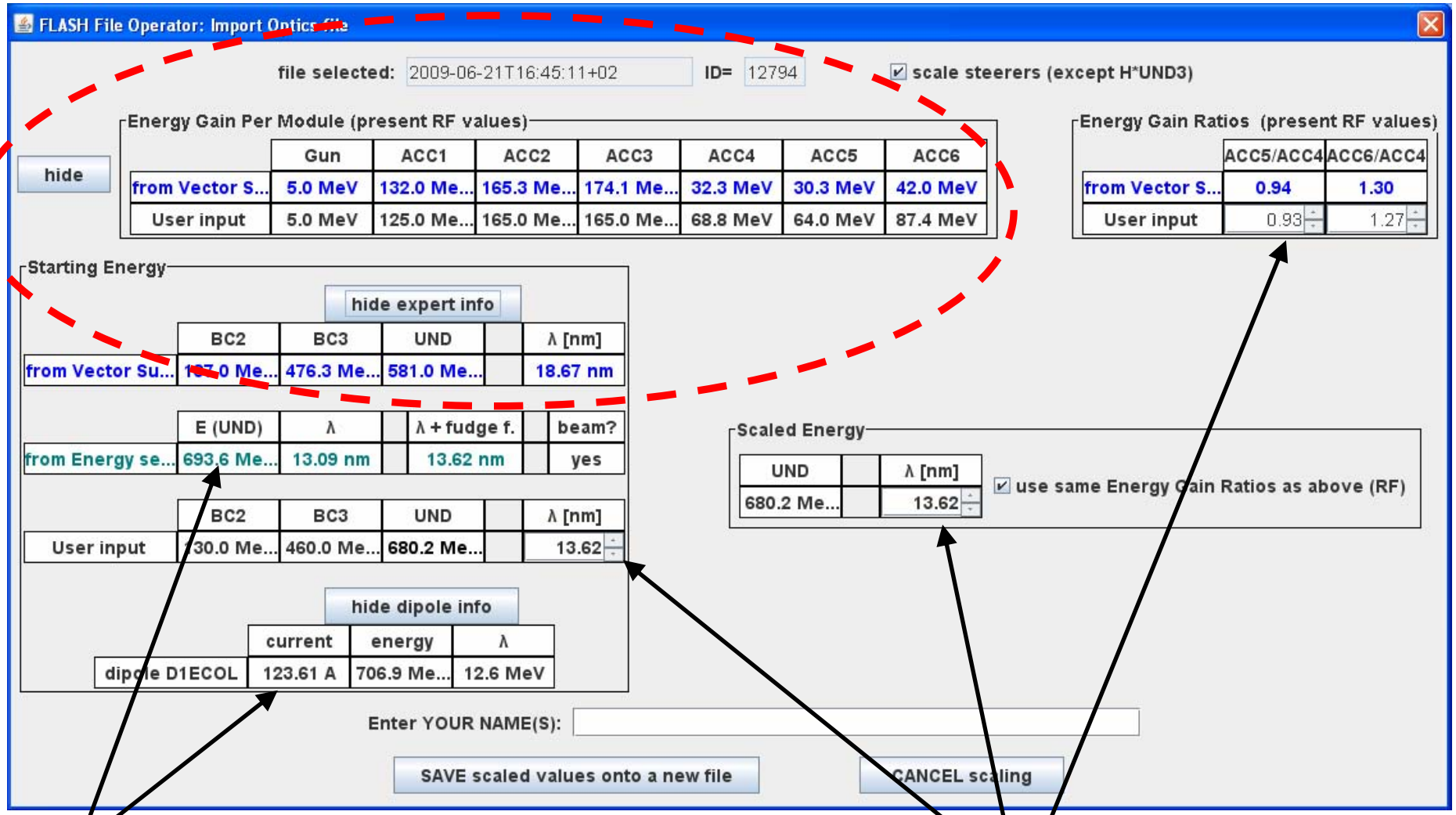
enter new wavelength



it creates a new file:
ONLY with magnets

2) catalog of files: scale magnets with energy:

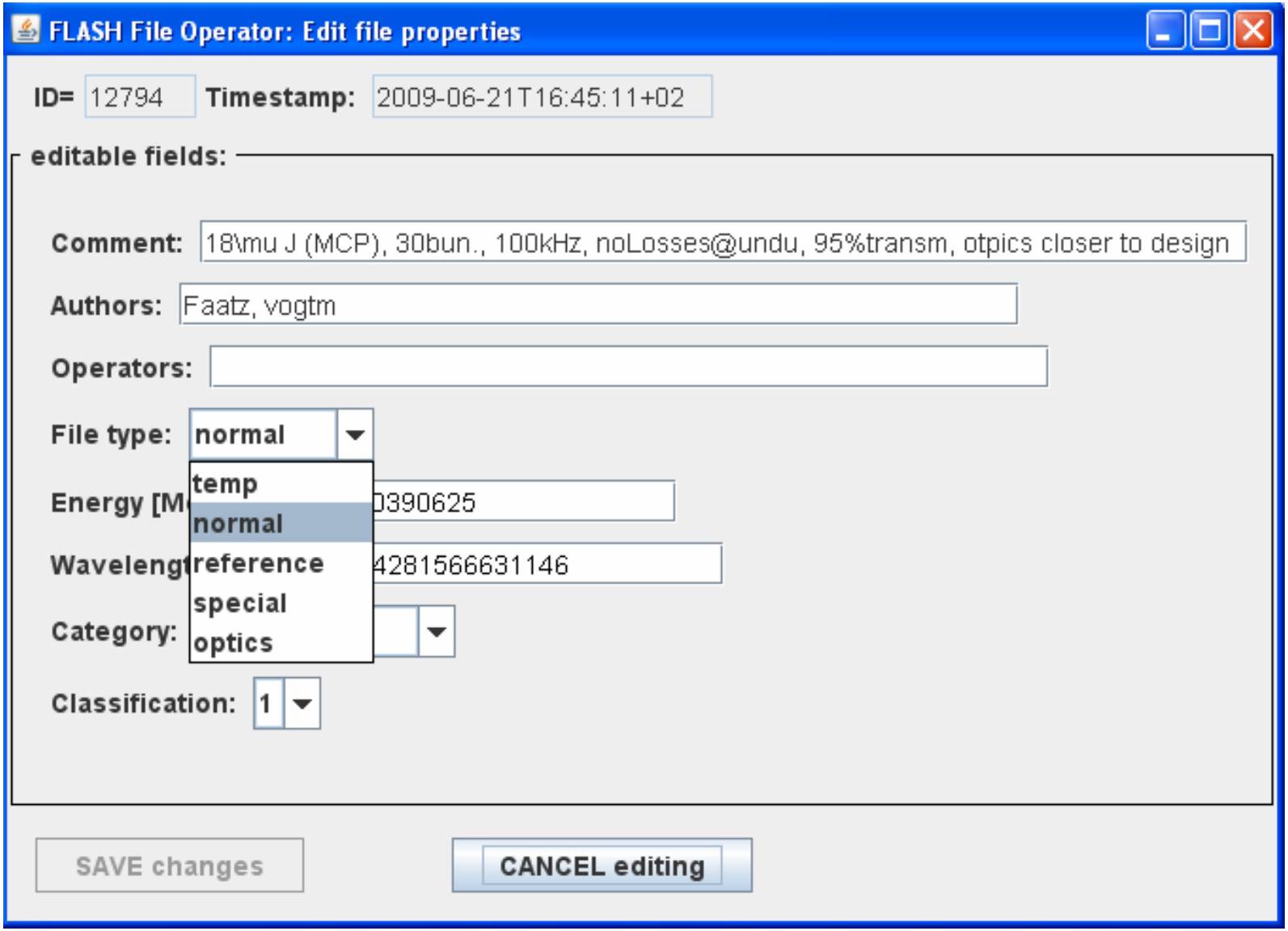
present RF values



file values

your input values

2) catalog of files: edit catalog entry:



File type

temp file: for temporary data or scratch data or data was edited/changed
(beam is off or some systems are off)

normal file: there is beam (good transmission)

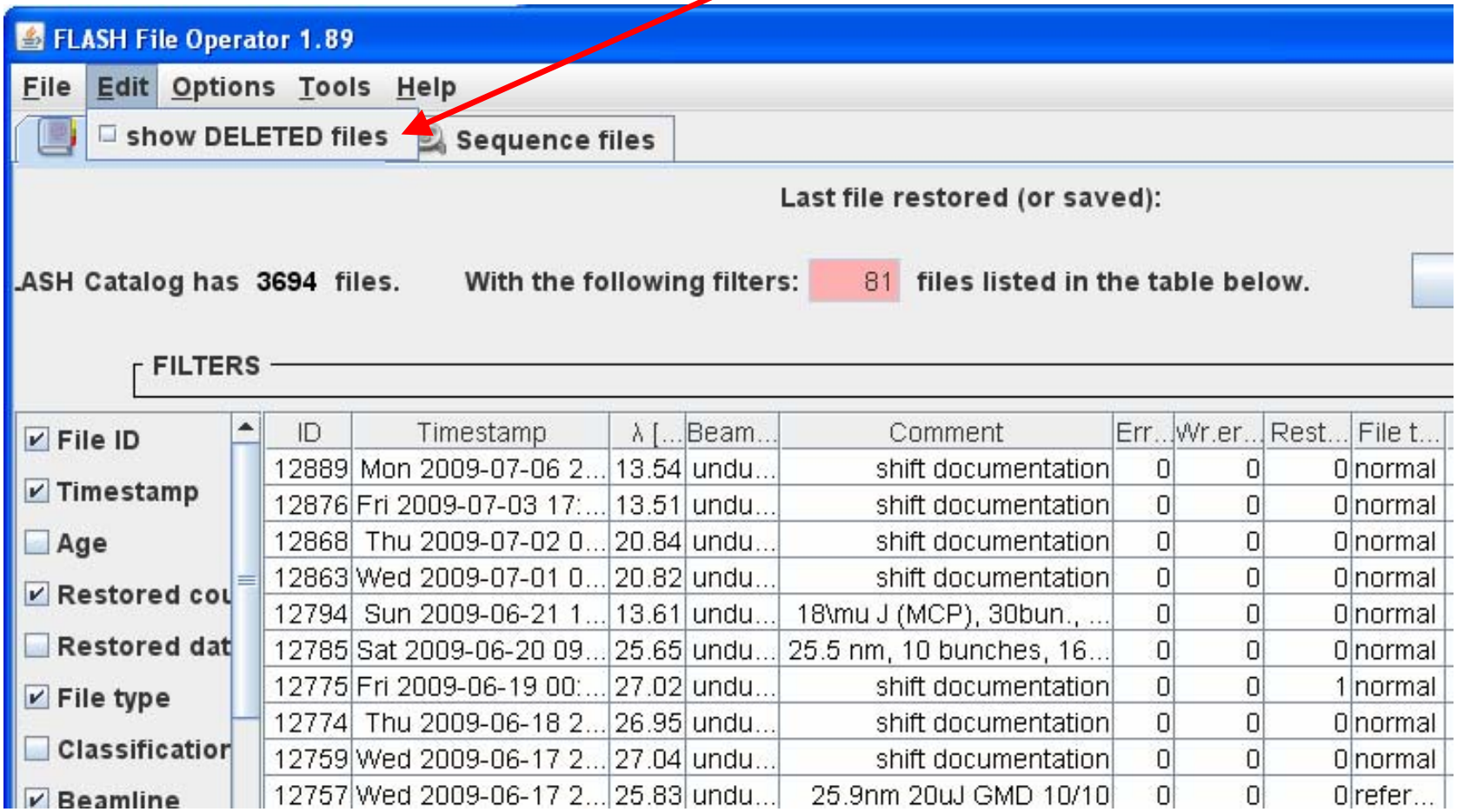
reference file: official file for routine operation
(a coordinator recommends the use of this file)

special file: special settings for machine studies, tests, etc.

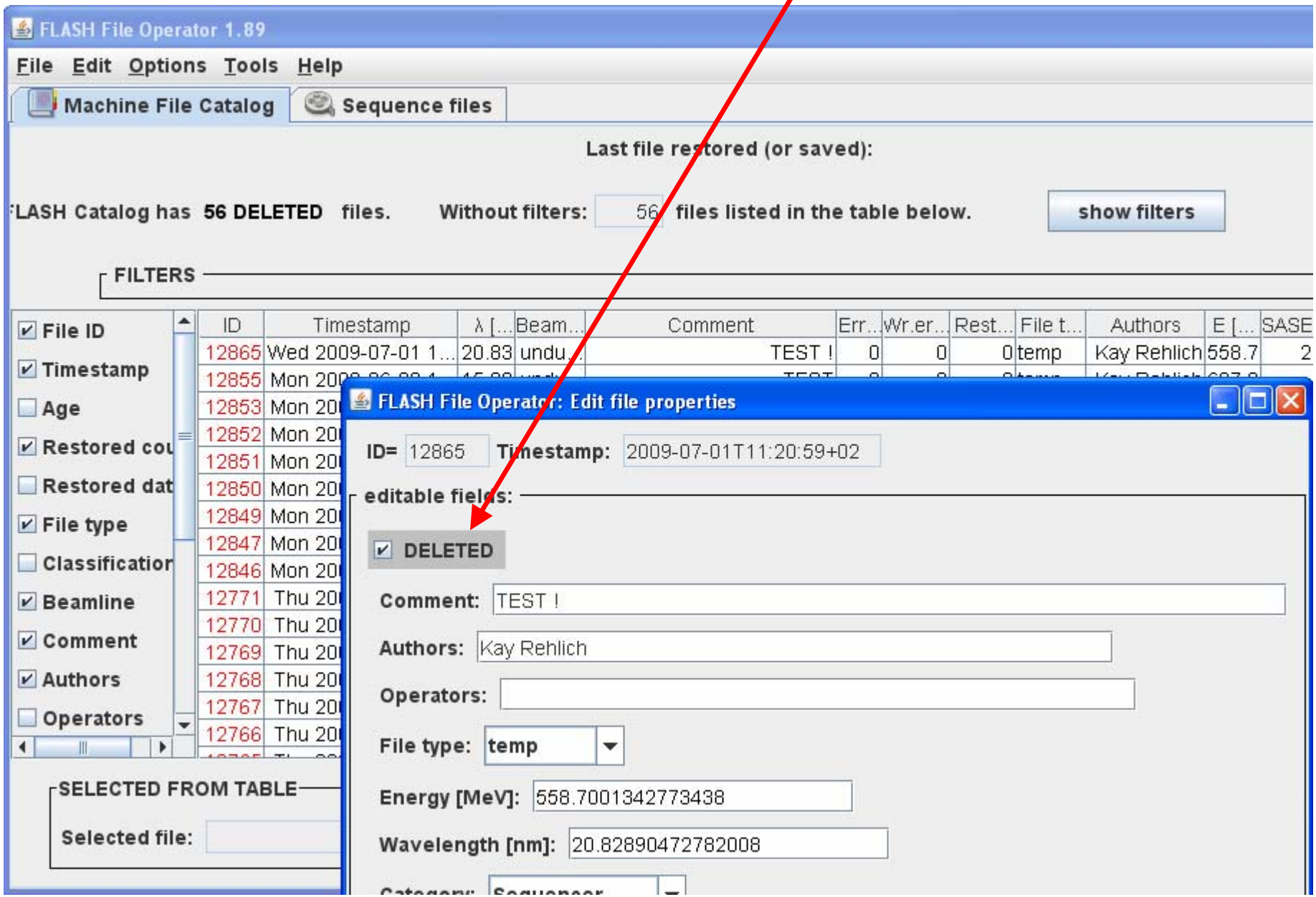
optics file: values calculated from optics programs

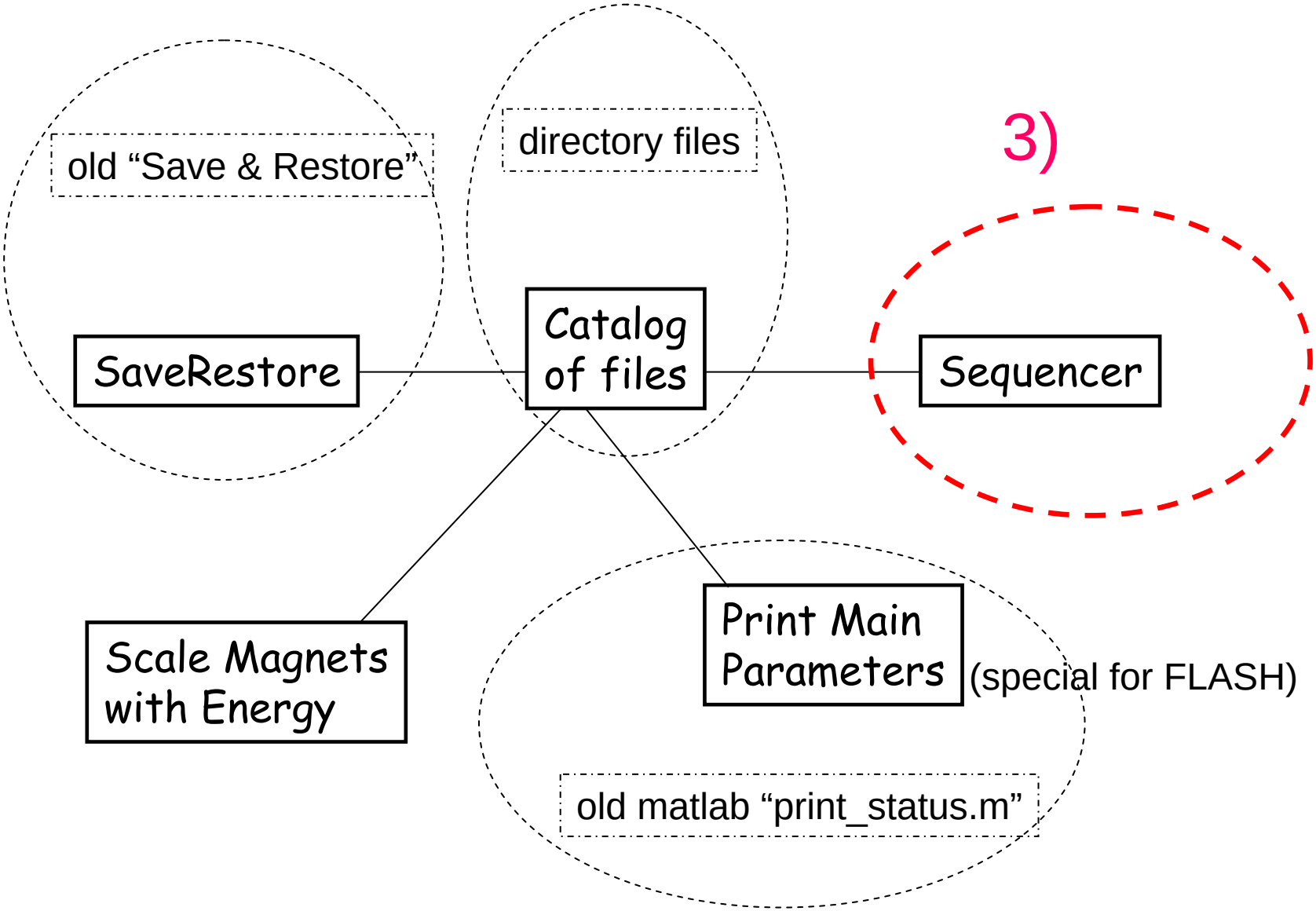
2) catalog of files: remove/recover

to see deleted files

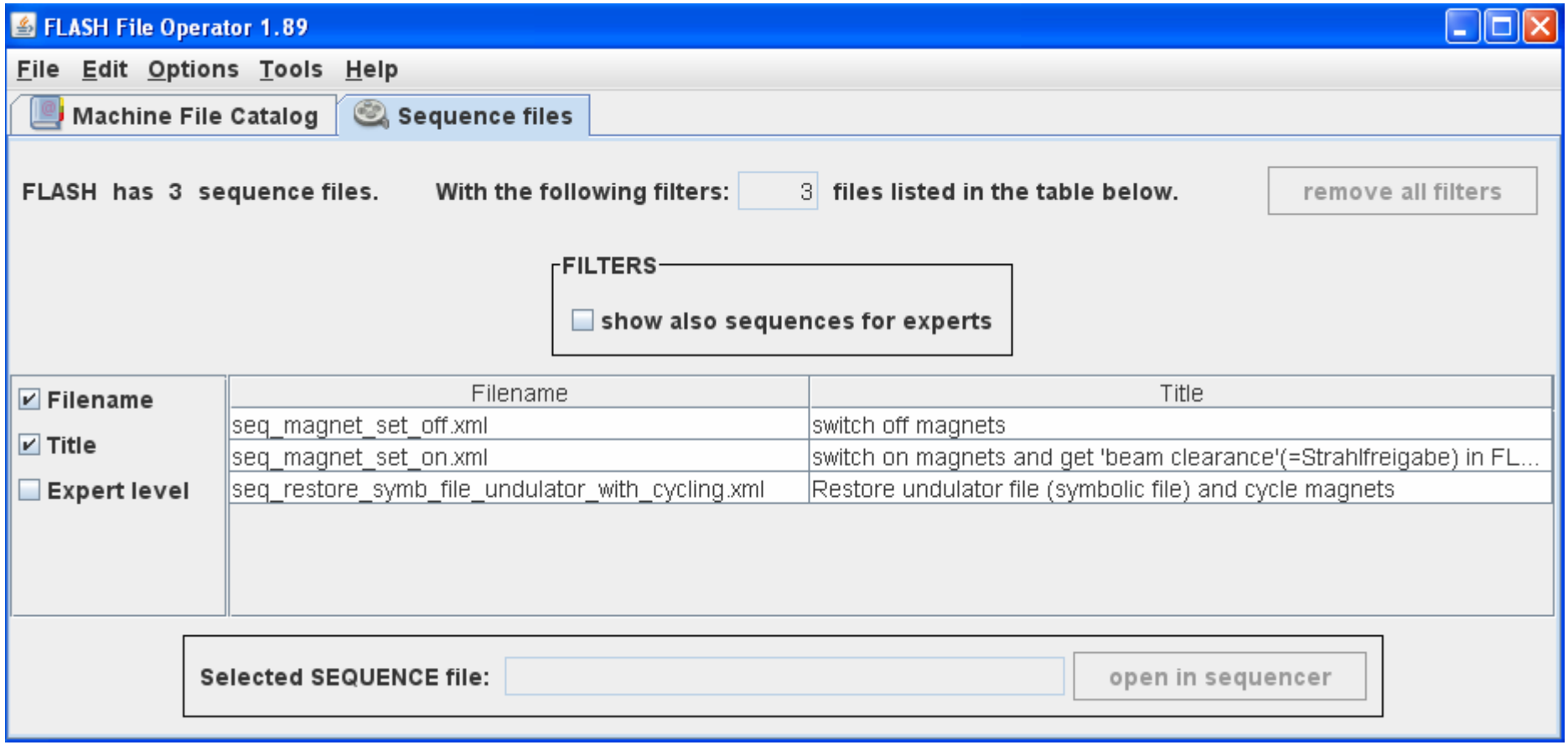


2) catalog of files: remove/recover



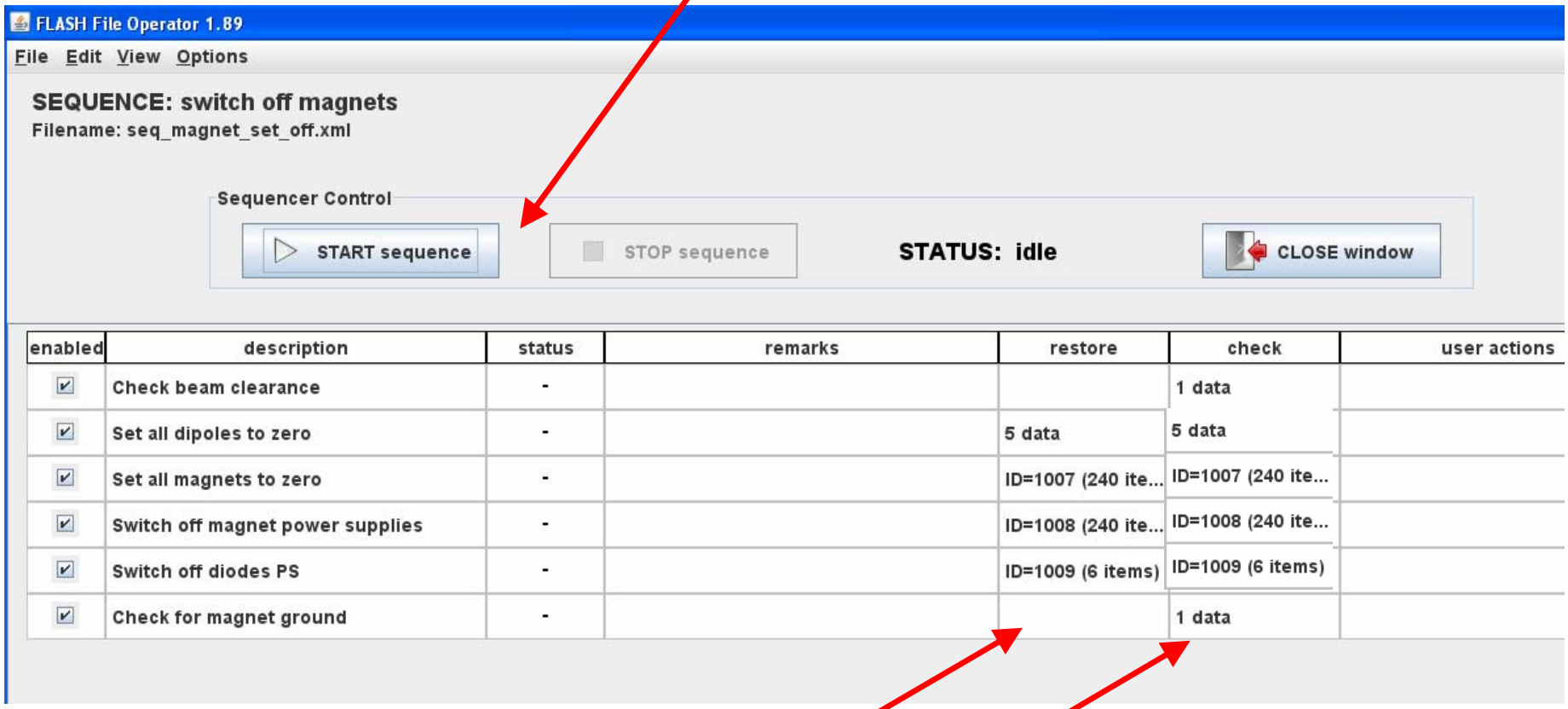

old “Save & Restore”
directory files
3)
SaveRestore
Catalog of files
Sequencer
Scale Magnets with Energy
Print Main Parameters
(special for FLASH)
old matlab “print_status.m”

3) sequencer: list of sequences:



3) sequencer

control buttons: start/pause/stop



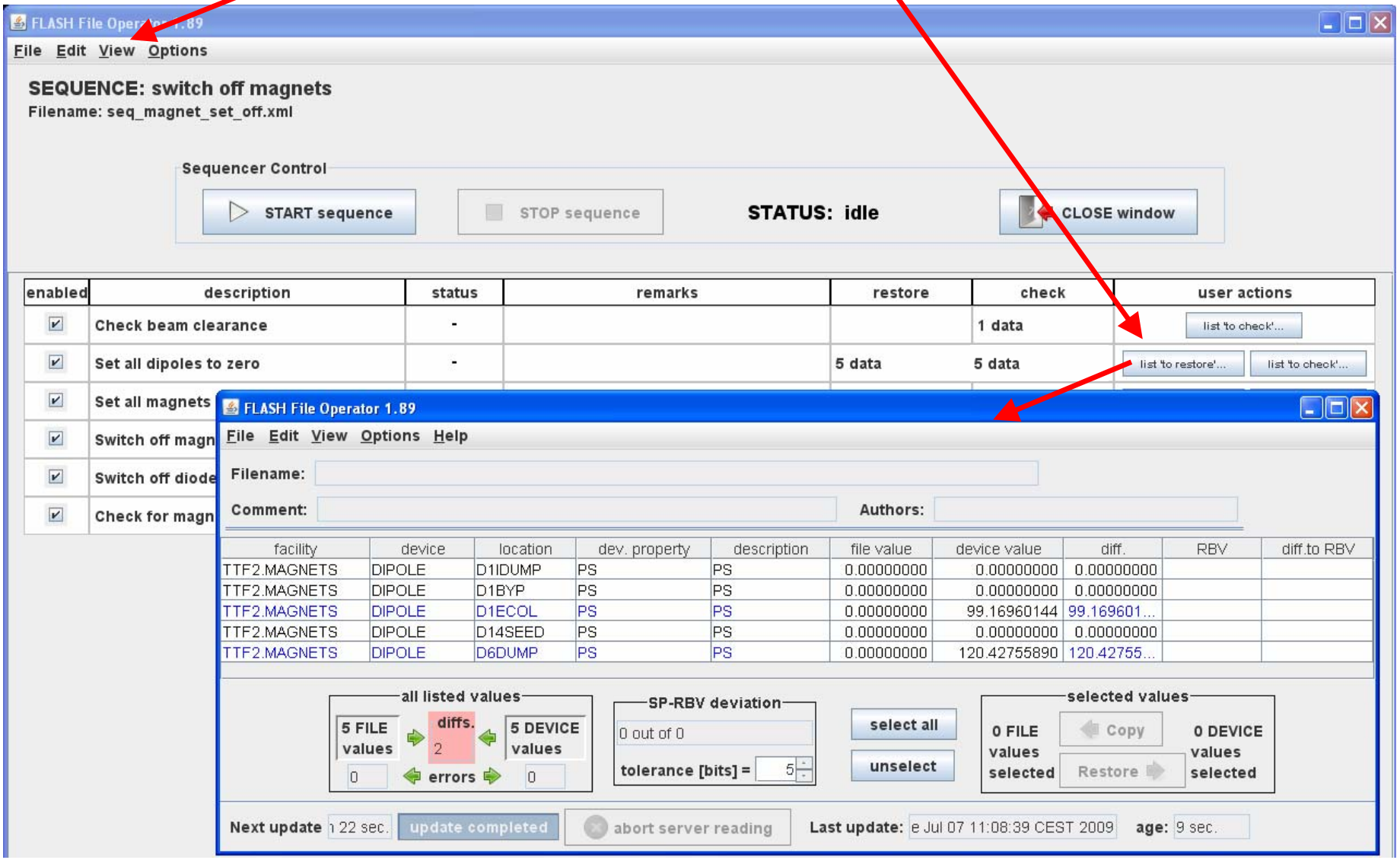
enabled	description	status	remarks	restore	check	user actions
☑	Check beam clearance	-			1 data	
☑	Set all dipoles to zero	-		5 data	5 data	
☑	Set all magnets to zero	-		ID=1007 (240 ite...	ID=1007 (240 ite...	
☑	Switch off magnet power supplies	-		ID=1008 (240 ite...	ID=1008 (240 ite...	
☑	Switch off diodes PS	-		ID=1009 (6 items)	ID=1009 (6 items)	
☑	Check for magnet ground	-			1 data	

each step:

- will restore 'something'
- will check 'something' → if ok, go to next step

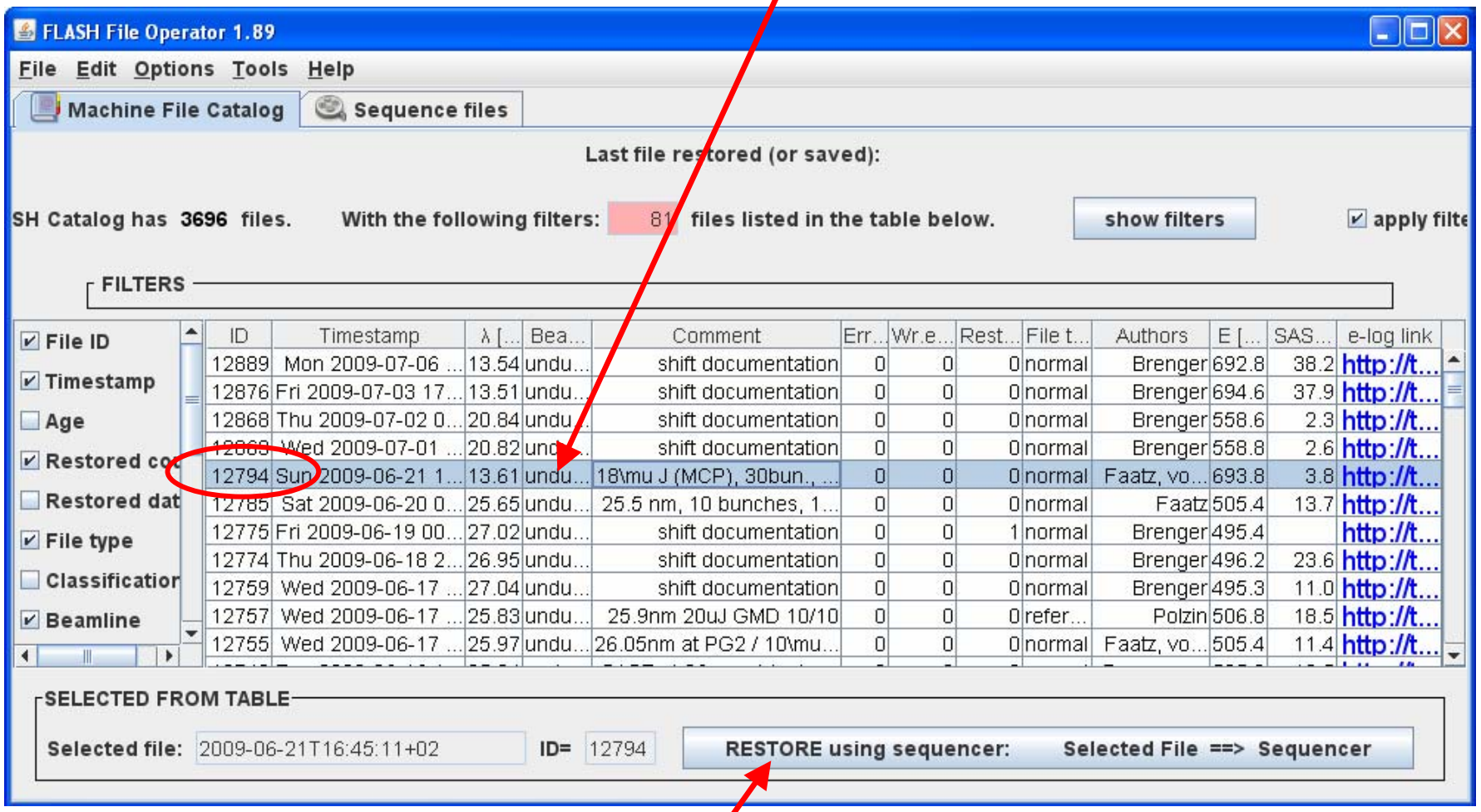
3) sequencer: how to see what it does:

expert buttons: “list to restore”, “list to check”



3) sequencer: how to restore a file

1. select a file

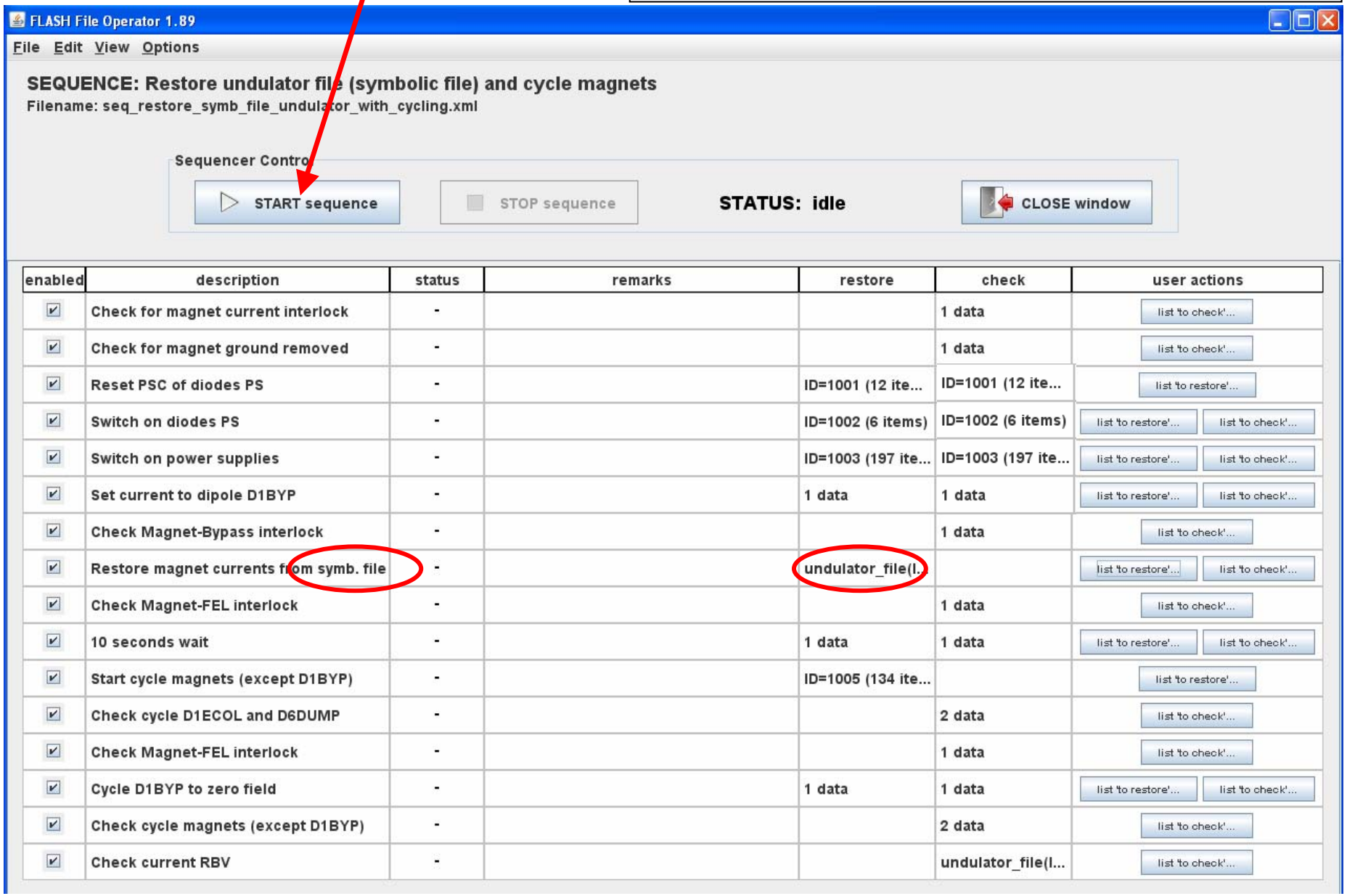


2. push button 'restore'

3) sequencer: how to restore a file

3. push button 'start'

sequence: restore + cycling



enabled	description	status	remarks	restore	check	user actions
☑	Check for magnet current interlock	-			1 data	list 'to check'...
☑	Check for magnet ground removed	-			1 data	list 'to check'...
☑	Reset PSC of diodes PS	-		ID=1001 (12 ite...	ID=1001 (12 ite...	list 'to restore'...
☑	Switch on diodes PS	-		ID=1002 (6 items)	ID=1002 (6 items)	list 'to restore'... / list 'to check'...
☑	Switch on power supplies	-		ID=1003 (197 ite...	ID=1003 (197 ite...	list 'to restore'... / list 'to check'...
☑	Set current to dipole D1BYP	-		1 data	1 data	list 'to restore'... / list 'to check'...
☑	Check Magnet-Bypass interlock	-			1 data	list 'to check'...
☑	Restore magnet currents from symb. file	-		undulator_file(I...		list 'to restore'... / list 'to check'...
☑	Check Magnet-FEL interlock	-			1 data	list 'to check'...
☑	10 seconds wait	-		1 data	1 data	list 'to restore'... / list 'to check'...
☑	Start cycle magnets (except D1BYP)	-		ID=1005 (134 ite...		list 'to restore'...
☑	Check cycle D1ECOL and D6DUMP	-			2 data	list 'to check'...
☑	Check Magnet-FEL interlock	-			1 data	list 'to check'...
☑	Cycle D1BYP to zero field	-		1 data	1 data	list 'to restore'... / list 'to check'...
☑	Check cycle magnets (except D1BYP)	-			2 data	list 'to check'...
☑	Check current RBV	-			undulator_file(I...	list 'to check'...

Thank you for your attention

pedro.castro@desy.de