

EPICS Collaboration Meeting Spring 2012, SLAC

Development and Deployment of CSS at KEK

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■ Purpose

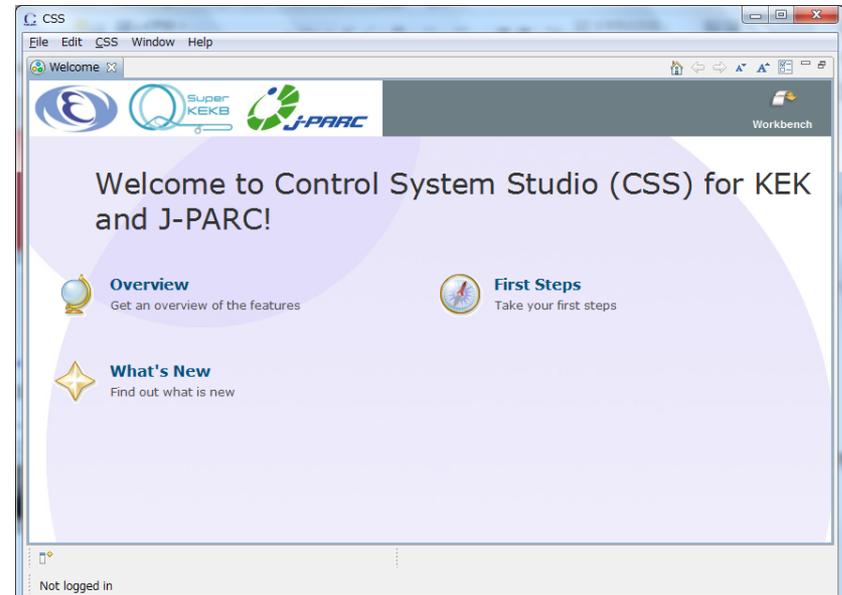
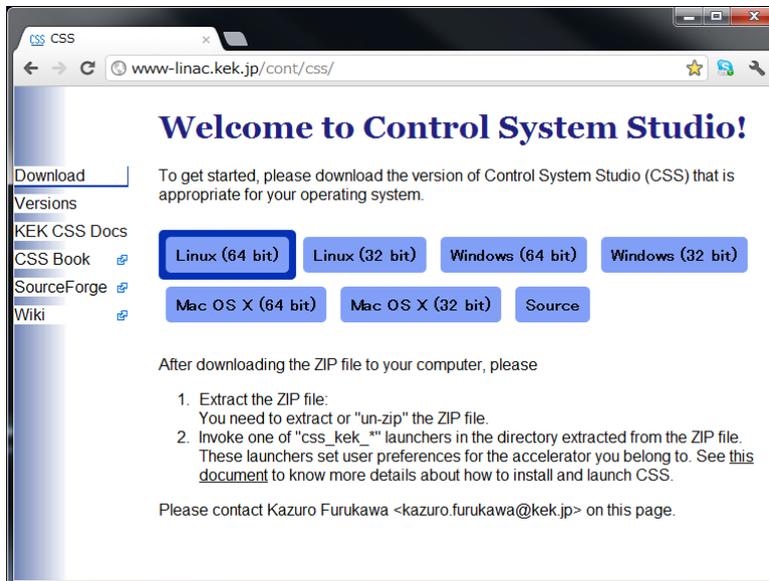
- Share our experiences with CSS developers/users and those who want to develop/deploy CSS in your site.

■ Agenda

- Development and release of CSS KEK.
- Deployment example of CSS in various groups in KEK.

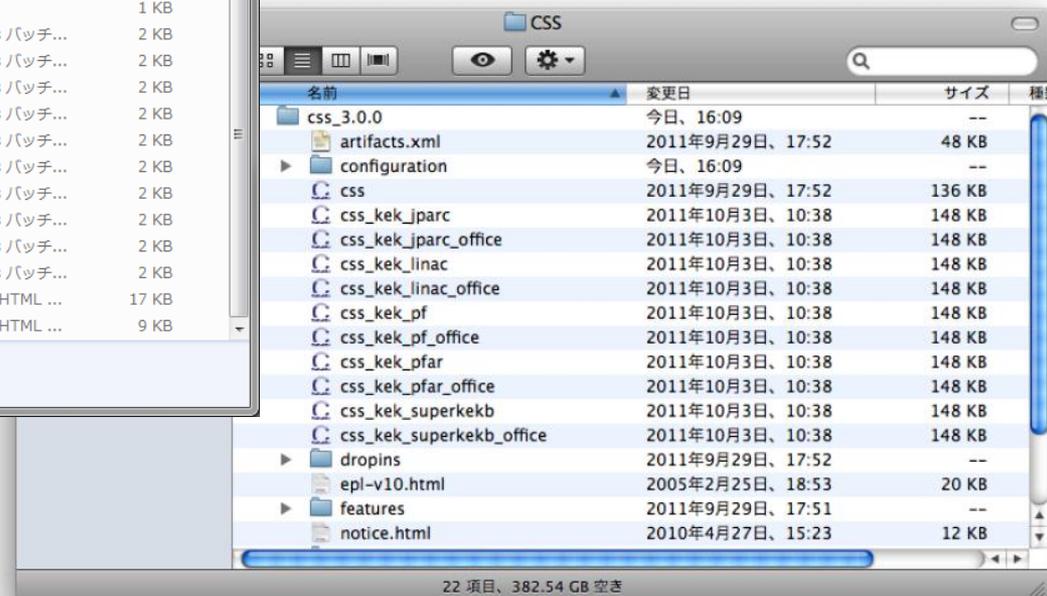
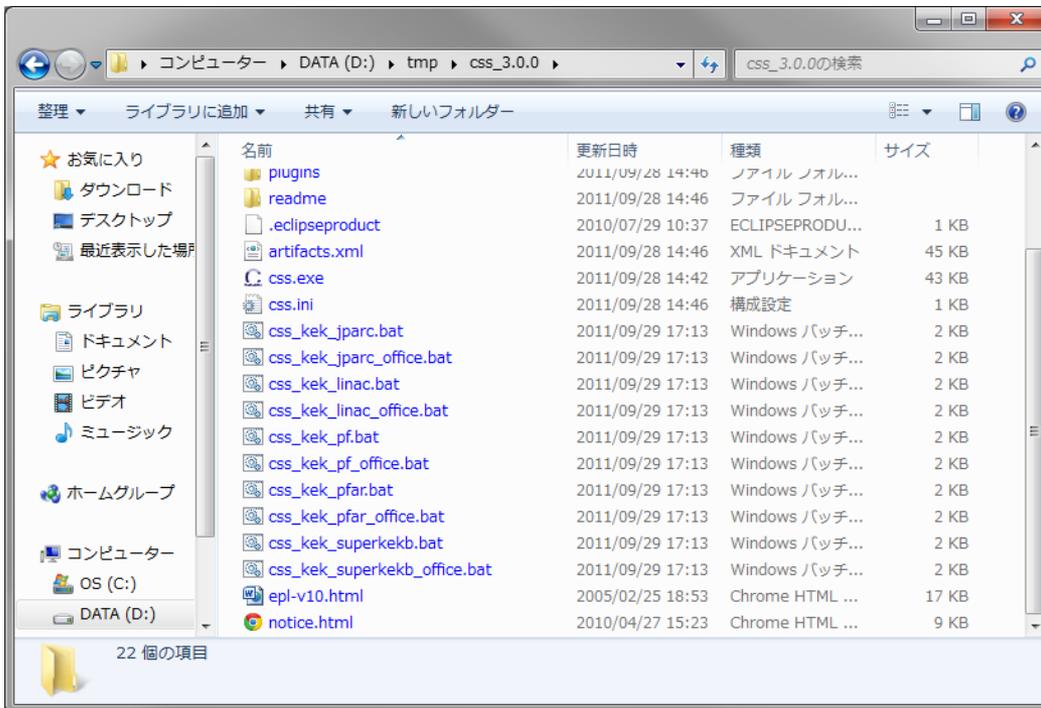
DEVELOPMENT AND RELEASE OF CSS KEK

- Includes BOY, Data Browser, Probe and some features specific to KEK.
 - Does not include, Scan Engine, Channel Finder, BEAST UI.
- Available from <http://www-linac.kek.jp/cont/css/>



- Release history
 - 3.0.0 (11th Aug 2011, done by Kay)
 - 3.0.0 (3rd Oct 2011)
 - Launchers + more platforms.
 - 3.0.1 (21th Dec 2011)
 - 3.1.0 (26th Feb 2012)
- KEK specific features
 - Launcher for each accelerator (CSS KEK 3.0.0).
 - Archive reader for kblog (CSS KEK 3.0.1).
- Extension of Data Browser
 - Arbitrary waveform element in plot area (CSS KEK 3.1.0).

- Launcher is prepared for each accelerator in KEK.



- Launcher does the following things:
 - Generate preference file (*.ini) based on the default settings for each accelerator.

```
echo org.csstudio.platform.libs.epics/addr_list=xxx.xxx.xxx.xxx  
> %TEMP%\%LINAC%.ini
```

- Run CSS with “-pluginCustomization” option.

```
start css.exe -pluginCustomization %TEMP%\%LINAC%.ini
```

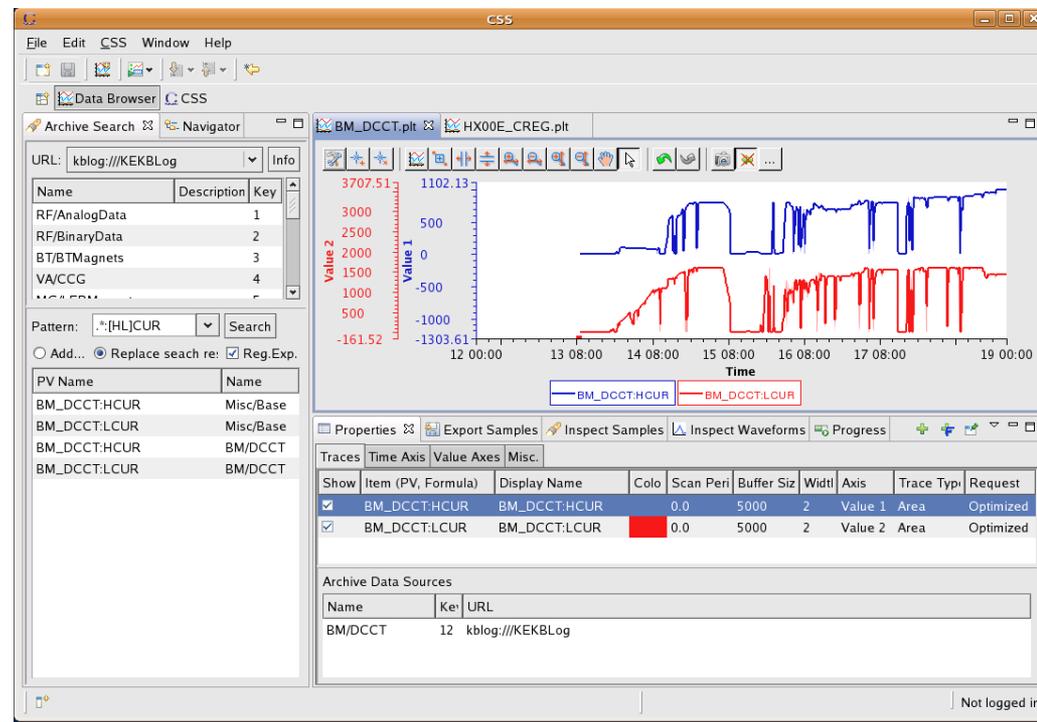
- Do not have to make product for each accelerator (or each site).
- Can make use of environmental variables
 - It may be useful to set EPICS address list from environmental variable EPICS_CA_ADDR_LIST.

```
echo "org.csstudio.platform.libs.epics/addr_list=${EPICS_CA_ADDR_LIST}"  
> foo.ini  
./css -pluginCustomization foo.ini
```

- TER CODAC Core System benefits from this approach.
- What kind of settings are available?
 - See “preferences.ini” in the source tree of each plugin.
 - e.g. org.csstudio.platform.libs.epics

Archive reader for kblog

- kblog
 - Archiving system specific to (Super)KEKB.
- org.csstudio.archive.reader.kblog
 - Interface to command line tool of kblog.
 - 13 Java source files
 - 1563 lines



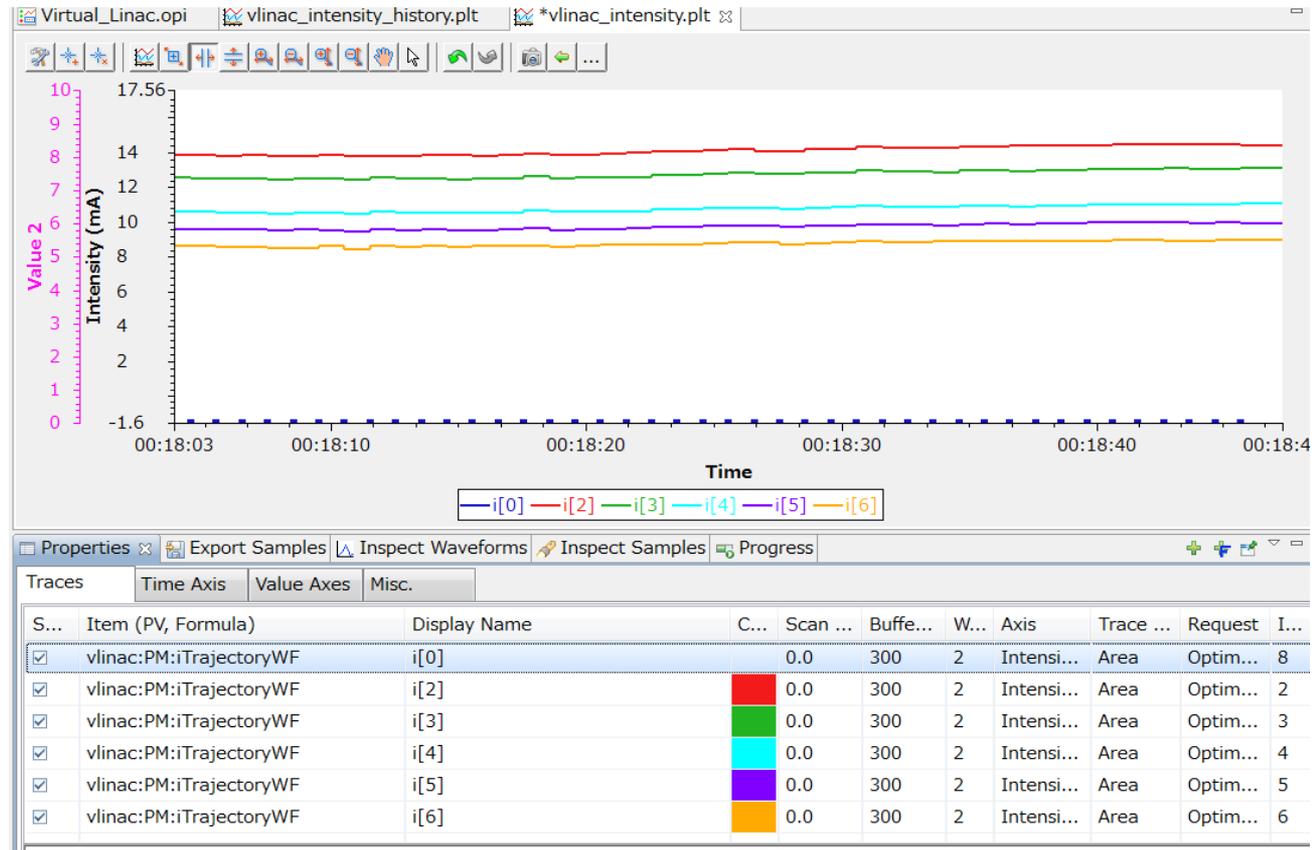
What needs to be done to support additional archiving system



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- org.csstudio.archive.reader.ArchiveReader interface
 - PV Search
 - `getNamesByPattern(int key, String glob_pattern)`
 - `getNamesByRegEx(int key, String reg_exp)`
 - Acquiring historical data
 - `getRawValues(int key, String name, ITimestamp start, ITimestamp end)`
 - `getOptimizedValues(int key, String name, ITimestamp start, ITimestamp end, int count)`
 - Others
 - `getServerName()`
 - `getDescription()`
 - etc.
- See other implementations for more details!
 - `org.csstudio.archive.reader.*`

- Became able to show an arbitrary element of waveform in plot area (in KEK 3.1.0).
- You can also benefit from this enhancement!



DEPLOYMENT AT KEK

Steps for deployment



- Study and evaluation
 - Feb 2010 -
 - Release of CSS KEK
 - Aug 2011 -
 - Trainings for beginners
 - Feb - Mar 2012
-
- <http://www-linac.kek.jp/cont/epics/css/>

- CSS Scripting with Python (1st February)
- CSS for beginners
 - Installation, Perspectives, Widgets (8th February)
 - Data Browser, Macro, Rules (15th February)
 - Script, Action, Special PVs (8th March)

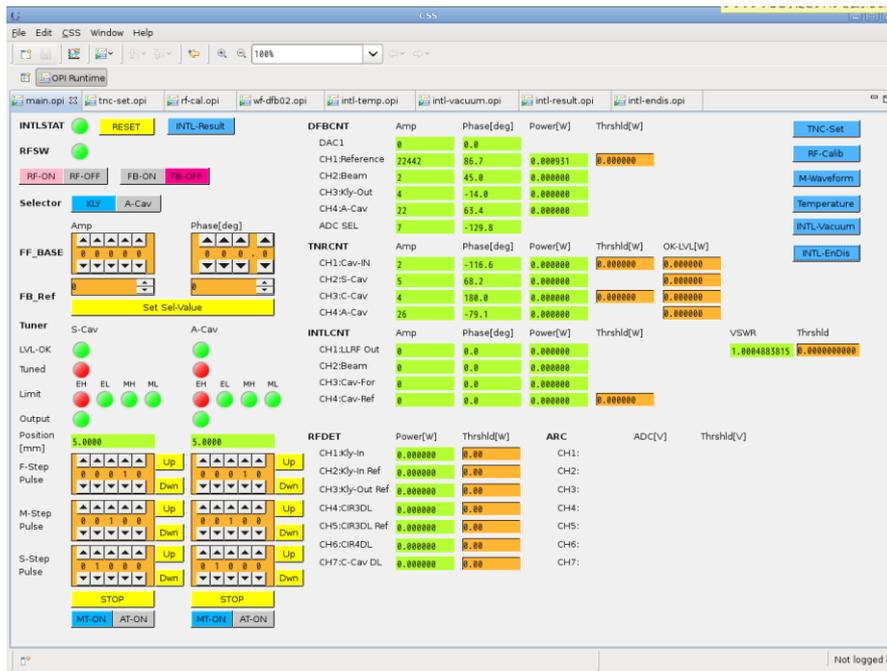


Deployment examples

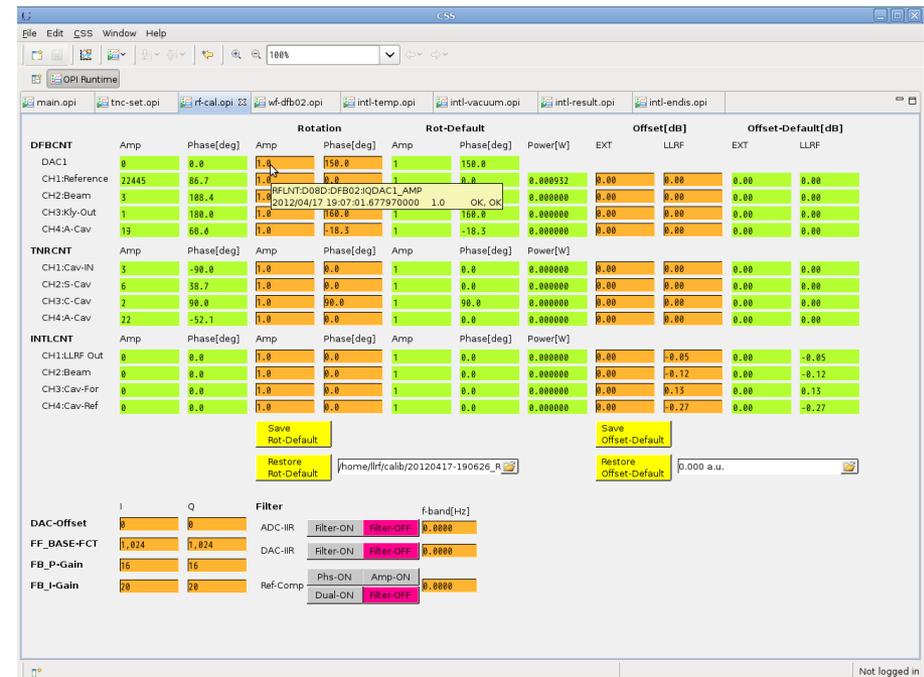
- SuperKEKB LLRF
- SuperKEKB safety group
- PF

Pictures are donated by Dr. Nakanishi (KEK) and Mr. Deguchi (Mitsubishi Denki Tokki).

- Developing Beta version of LLRF system.
 - CSS BOY is the best tool to quickly create operator interfaces.
 - Take full advantage of “loc://” PVs, Rules and scripts.



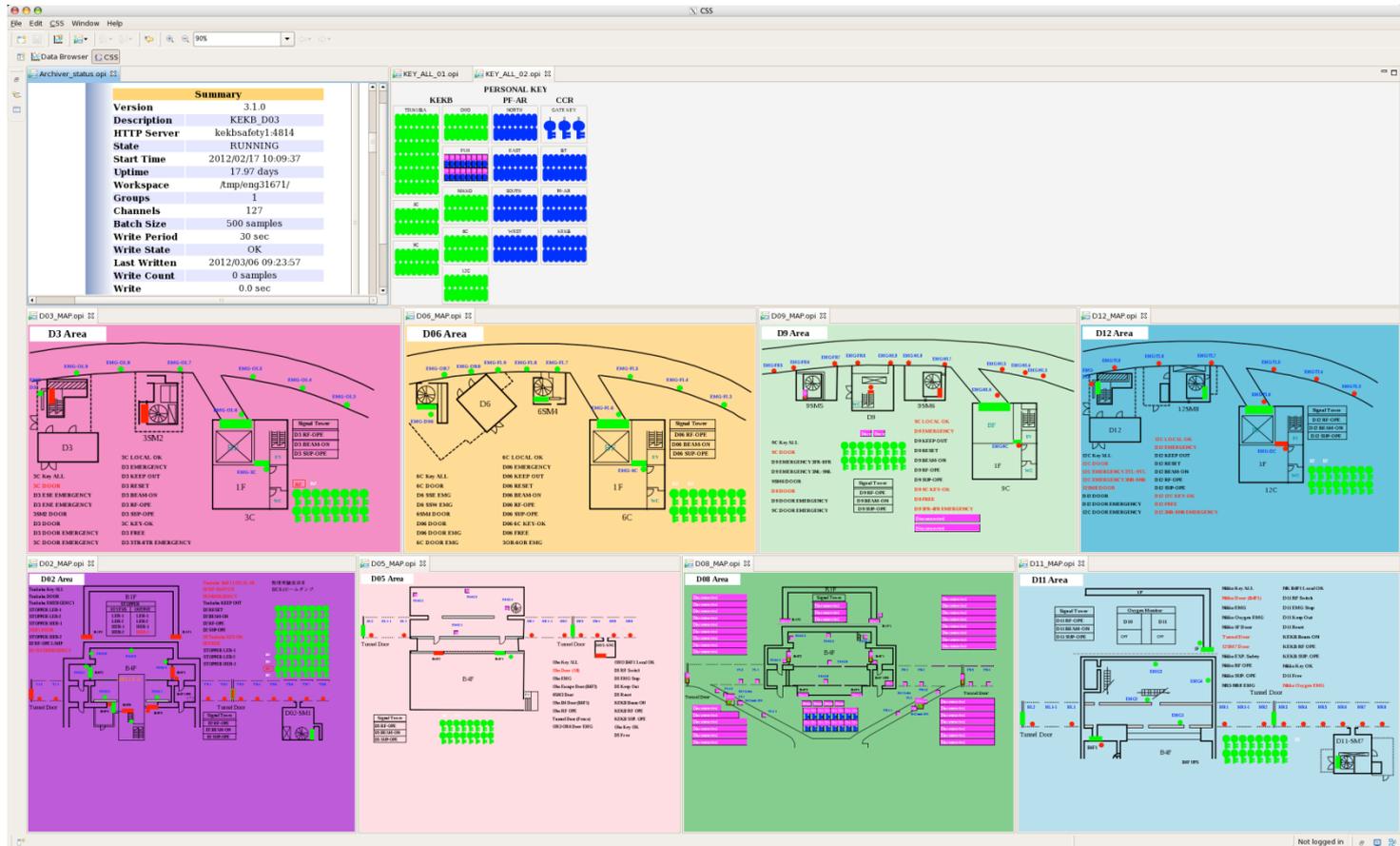
The screenshot shows the CSS BOY operator interface with several control panels and data tables. The top panel includes buttons for 'RESET', 'INTL_Result', 'TNC-Set', 'RF-Calib', 'M-Waveform', 'Temperature', 'INTL-Vacuum', and 'INTL-Endis'. The 'Selector' panel has 'KLY' and 'A-Cav' buttons. The 'FF_BASE' and 'FB_Ref' panels have numerical input fields and 'Set Sel Value' buttons. The 'Tuner' panel has 'S-Cav' and 'A-Cav' buttons and 'Limit' indicators. The 'Output Position' panel has 'STOP' buttons and 'MT-ON'/'AT-ON' buttons. The 'DFBCNT' table shows parameters for DAC1, CH1-Reference, CH2-Beam, CH3-Kly-Out, CH4-A-Cav, and ADC SEL. The 'TNRCNT' table shows parameters for CH1-Cav-IN, CH2-S-Cav, CH3-C-Cav, and CH4-A-Cav. The 'INTLCNT' table shows parameters for CH1-LLRF Out, CH2-Beam, CH3-Cav-For, and CH4-Cav-Ref. The 'RFDET' table shows parameters for CH1-Kly-in, CH2-Kly-in Ref, CH3-Kly-Out Ref, CH4-CIR3DL, CH5-CIR3DL Ref, CH6-CIR4DL, and CH7-C-Cav DL. The 'ARC' table shows parameters for CH1 through CH7. The 'ADC[V]' table shows parameters for CH1 through CH7.



The screenshot shows the CSS BOY operator interface with the 'Rotation' and 'Offset-Default' tables. The 'Rotation' table has columns for 'DFBCNT', 'Amp', 'Phase[deg]', 'Rot-Default', 'Rot-Default', 'Power[W]', 'EXT', 'LLRF', 'EXT', and 'LLRF'. The 'Offset-Default' table has columns for 'Offset[db]', 'Offset-Default[db]', and 'Offset-Default'. The 'Filter' table has columns for 'I', 'Q', 'ADC-IR', 'Filter-ON', 'Filter-OFF', and 'f.band[Hz]'. The 'DAC-Offset' table has columns for 'I', 'Q', 'ADC-IR', 'Filter-ON', 'Filter-OFF', and 'f.band[Hz]'. The 'FF_BASE-FCT' table has columns for 'I', 'Q', 'ADC-IR', 'Filter-ON', 'Filter-OFF', and 'f.band[Hz]'. The 'FB_P-Gain' table has columns for 'I', 'Q', 'ADC-IR', 'Filter-ON', 'Filter-OFF', and 'f.band[Hz]'. The 'FB_I-Gain' table has columns for 'I', 'Q', 'ADC-IR', 'Filter-ON', 'Filter-OFF', and 'f.band[Hz]'. The 'Save Rot-Default' and 'Restore Rot-Default' buttons are visible. The 'Save Offset-Default' and 'Restore Offset-Default' buttons are visible. The 'Filter' table has buttons for 'Filter-ON' and 'Filter-OFF'. The 'DAC-Offset' table has buttons for 'Filter-ON' and 'Filter-OFF'. The 'FF_BASE-FCT' table has buttons for 'Filter-ON' and 'Filter-OFF'. The 'FB_P-Gain' table has buttons for 'Phs-ON', 'Amp-ON', 'Dual-ON', and 'Filter-OFF'. The 'FB_I-Gain' table has buttons for 'Dual-ON' and 'Filter-OFF'.

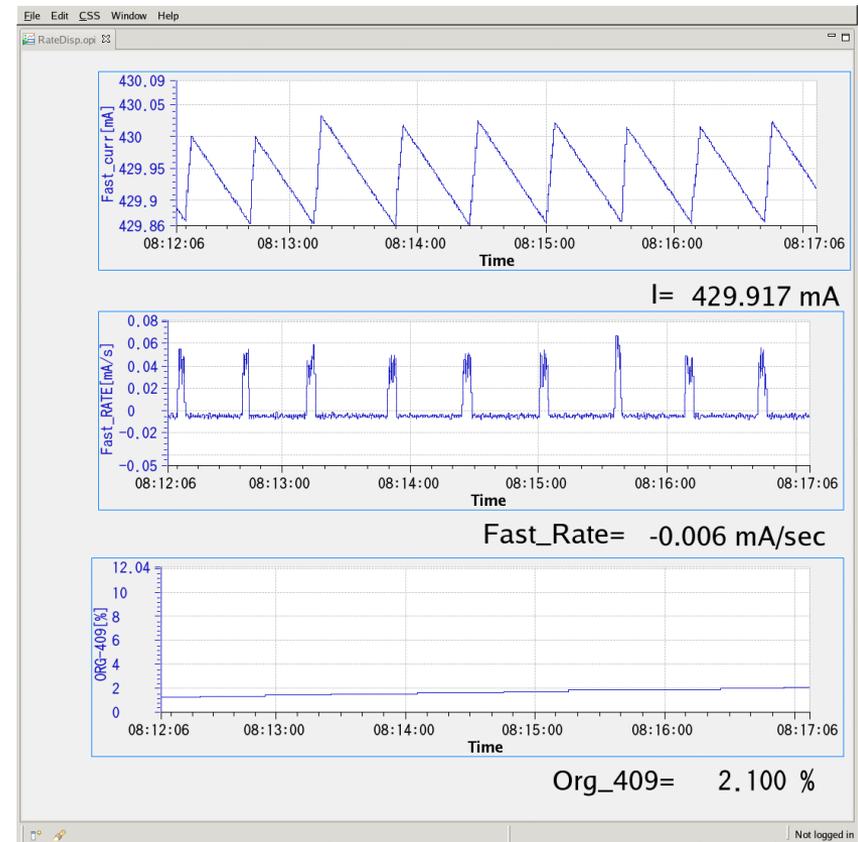
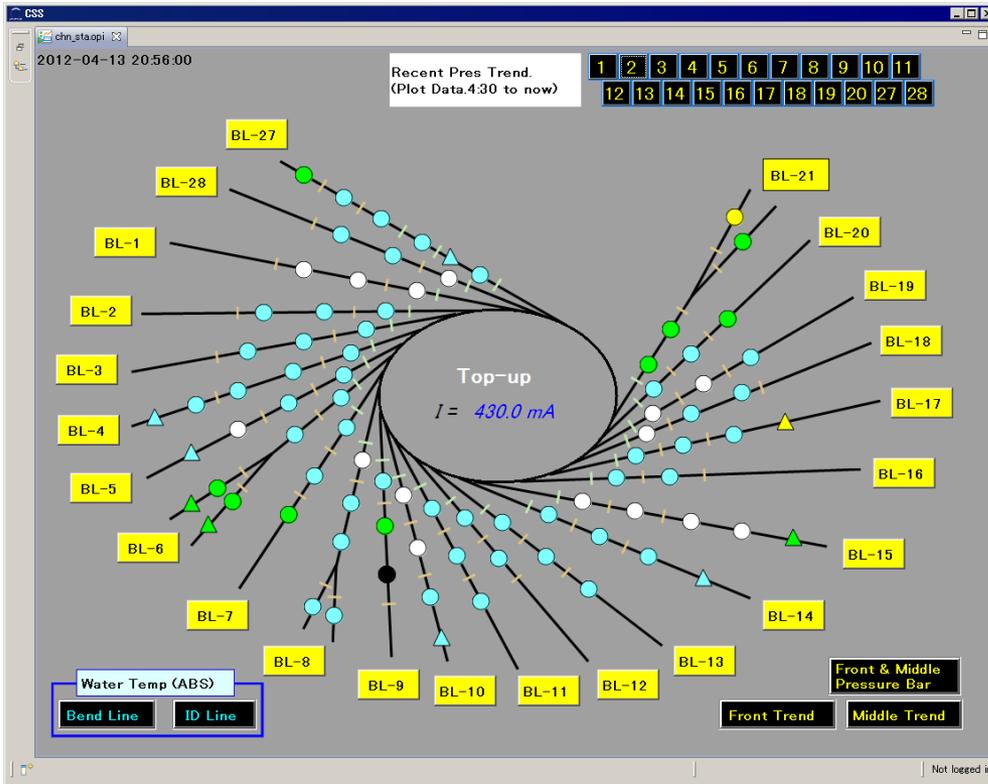
Picture is donated by Mr. Yoshii (Mitsubishi SC).

- Shows status of keys and doors.
- Multiple OPIs in one window.



Deployment at PF

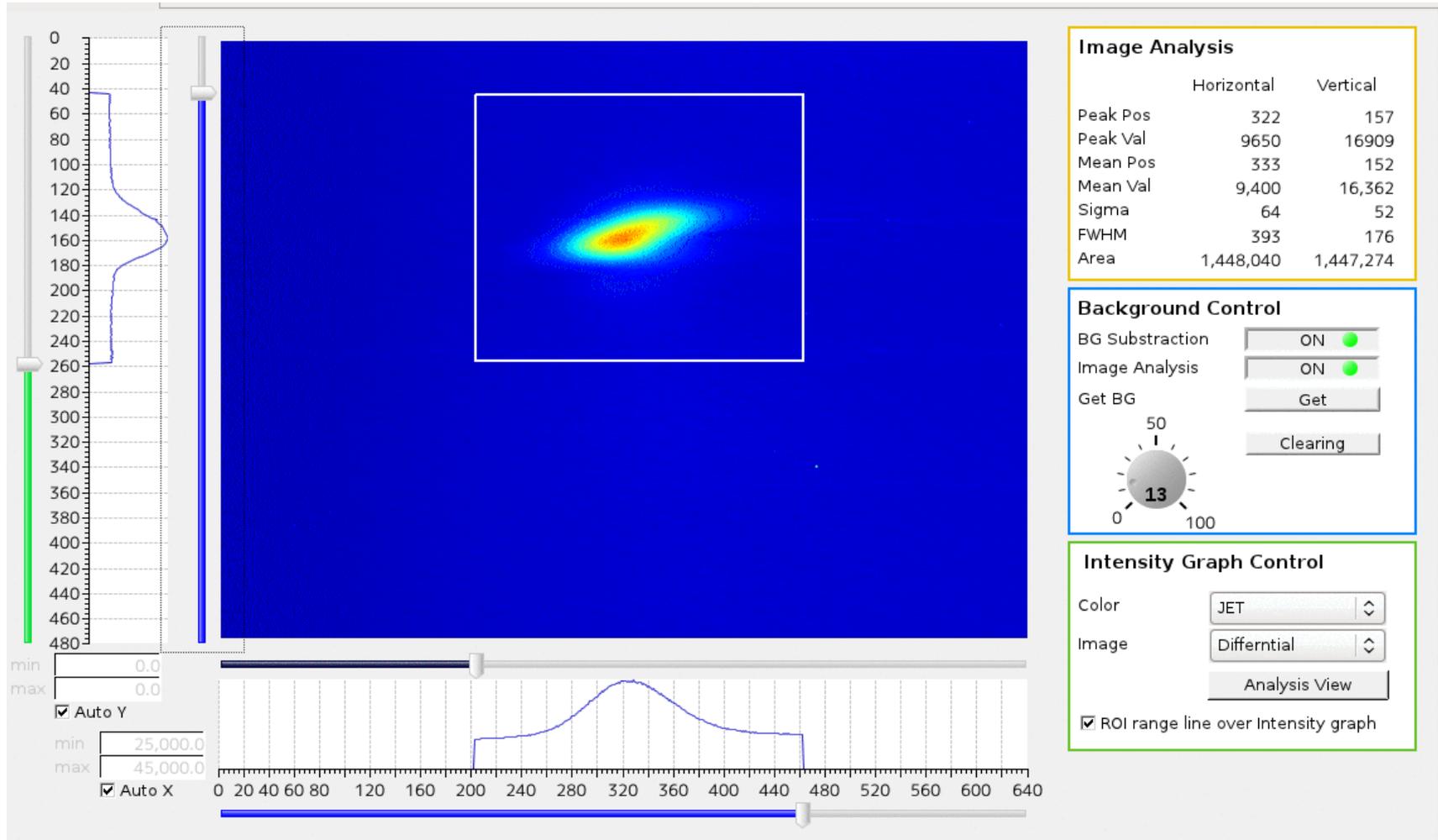
Pictures are donated by Dr. Obina (KEK) and Mr. Michikawa (Higashi Nihon Giken).



Deployment at PF

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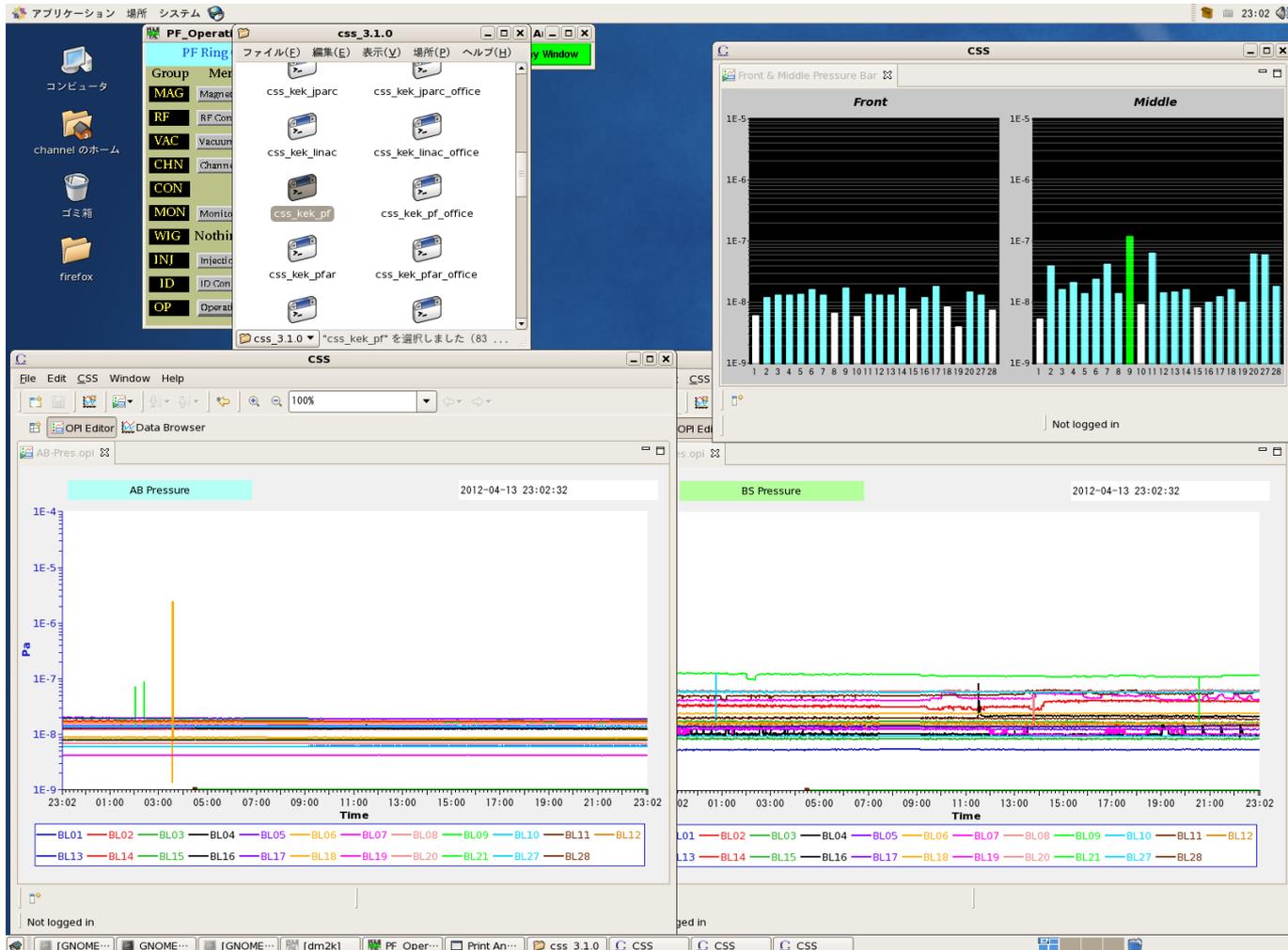
■ Screen monitor (nice example of Intensity Graph)



Deployment at PF

Pictures are donated by Dr. Obina (KEK) and Mr. Michikawa (Higashi Nihon Giken).

■ Monitoring degree of vacuum with Data Browser



- Users are happy with CSS.
 - Nice look and feel. (No middle button!)
 - Able to run CSS on Windows and Mac OS X without additional effort. (Java is required, though.)
 - Quickly migrated to CSS from EDM/medm.
 - Did not use automatic converter from EDM/medm to CSS BOY.
- RDB Archiver (PostgreSQL) in PF
 - Running in parallel with Channel Archiver for evaluation.
 - Required storage:
 - RDB Archiver : 1.5 GB / day
 - Channel Archiver : 800 MB / day
- RDB Archiver (PostgreSQL) in SuperKEKB
 - Store data locally in some groups.

CONCLUSION

- CSS KEK has been released at the same pace as the other sites.
- Development was done for KEK-specific features and a common feature.
- CSS is penetrating KEK.
- In the future...

Acknowledgement



- ORNL/SNS
 - Kay Kasemir
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