

KAGRA

Detector Characterization

Kazuhiro Hayama (Osaka City University)
On behalf of KAGRA Detector Characterization

Interface

Data Analysis

Veto info., target veto , Data quality, calibration accu.

Detector Characterization

PEM, Aux. channels, Online-monitors, diagnostics

Instruments

Human Resource

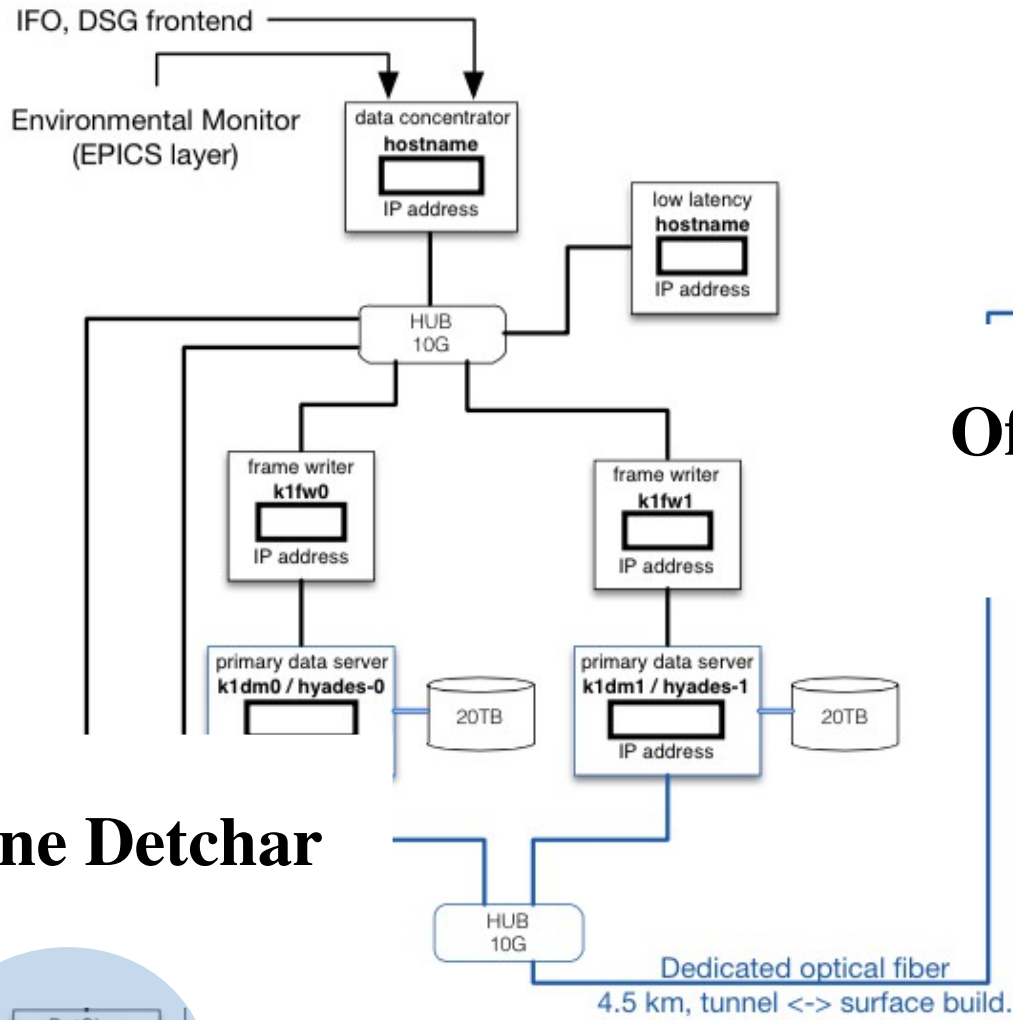
- **Chief : Hayama**
- **Akutsu, Kaneyama, Kokeyama, Miyakawa, Miyamoto, Ono, Shoda, Ueno, Yamamoto, Yokozawa, Yuzurihara**
- **KGWG detchar group (4)**

FTE : ~ 0.9

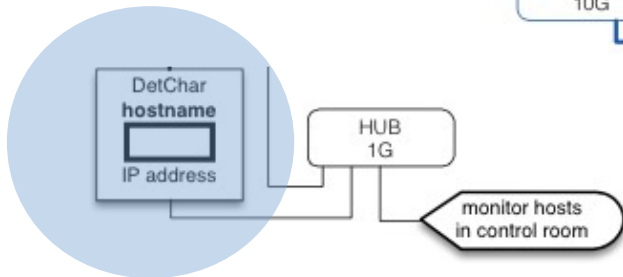
Tasks for iKAGRA

- **Commissioning phase**
 - **To provide diagnostics tools**
 - **To monitor whether data is normal or not**
 - **To find correlations between PEM channels.**
 - **To find non-stationary noise events, oscillations**
 - **...**
 - **Support to localize noise sources which prevent KAGRA from reaching the design sensitivity.**
 - **To supply data quality**
 - **With cooperation with subsystems, what kinds of EM, channels are needed.**
- **Observation phase**
 - **To provide data quality flags to the GW search group**
 - **To perform veto analysis using the data quality and multi-variate analysis**

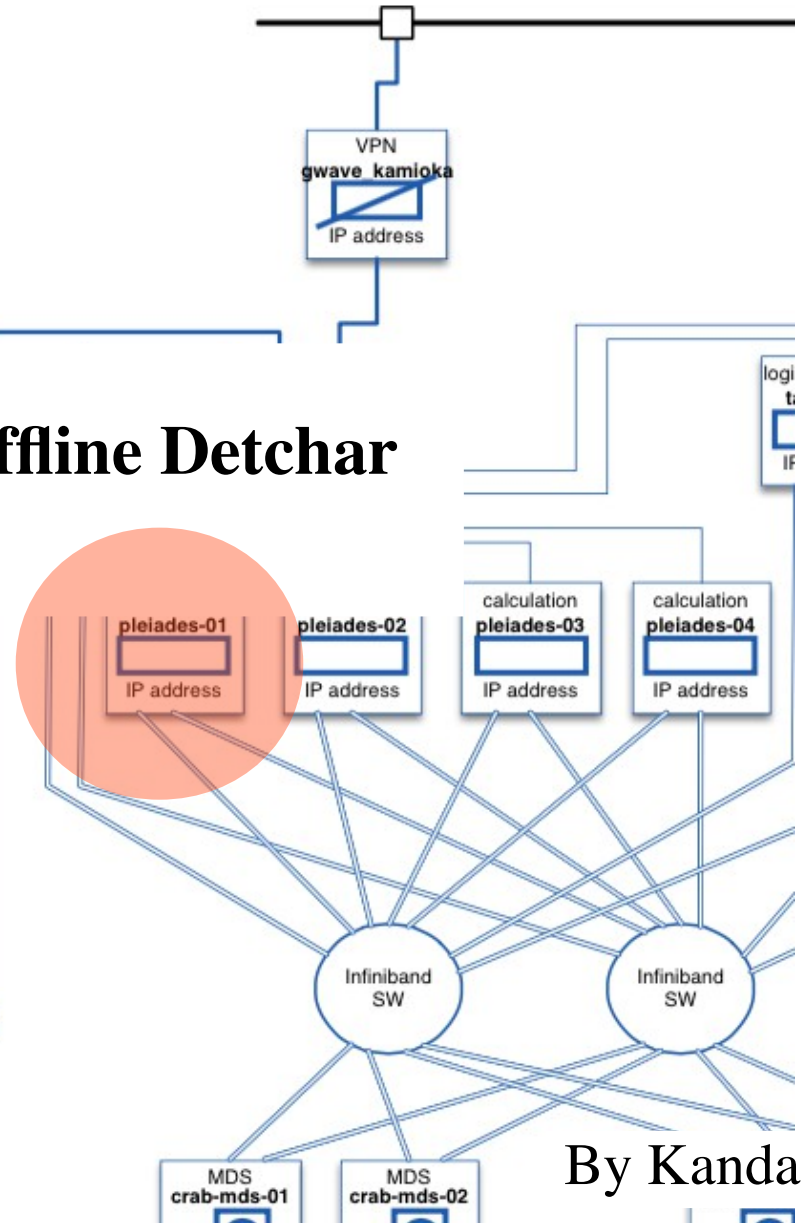
Network



Online Detchar



Offline Detchar



By Kanda

DetChar Projects

Primary Projects

- To maintain Diagnostics Test Tool
- Detchar GUI
- Glitch Monitor
- Detchar web page
- Line Monitor
- correlation finder
- Noise Modeling
- Rayleigh Monitor
- Noise Floor Monitoring
- Range Monitor
(Inspiral, Ringdown,
Insp-Merger-Ringdown,
Stochastic)
- Noise Budget
- Health Monitor
- Data base
- Quality flag

Special Projects

- Globally correlated mag noise
- Violin mode
- Multi-Channel Analysis
(with Korea detchar, Mano)
- Detchar shift plan
- Newtonian Noise
 - in progress
 - in slowly progress

Noise Characterization at the KAGRA site



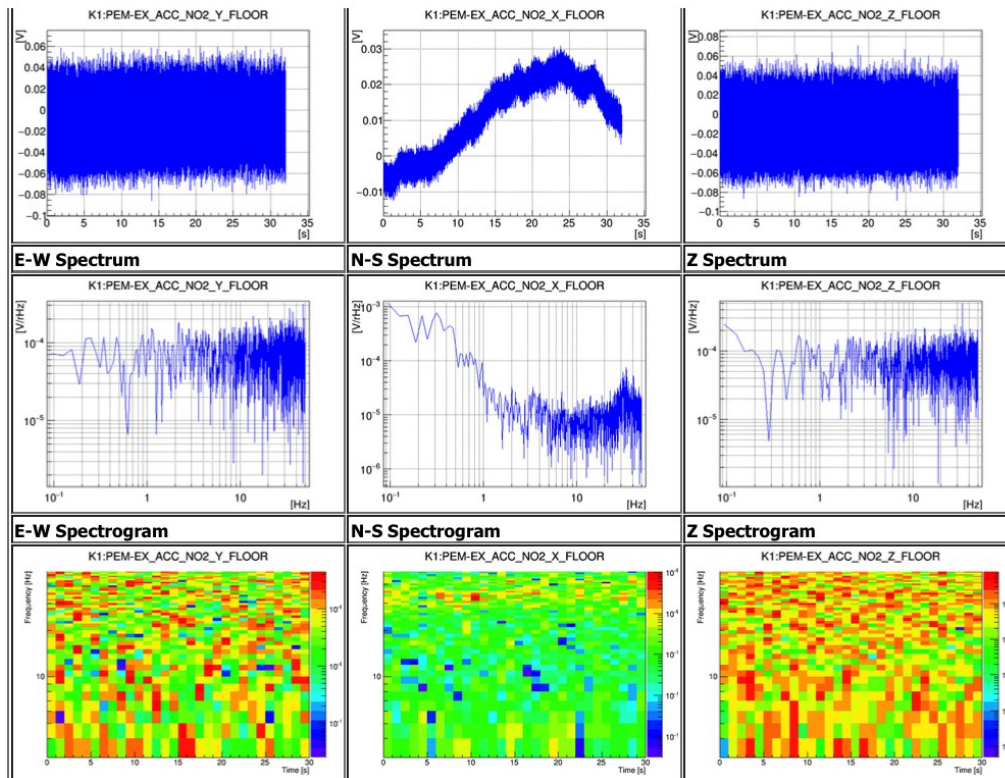
<https://github.com/gw-analysis/detector-characterization>⁶

Start Monitoring Environmental Activities @ X-end

With CRY, NAOJ, ICRR@Kamioka

DAQ system

Quick Look Webpage



Most of things can be done through Web

Open Web site, Ready!

Please access the following web and try it.

Yamamoto, Hayama,
advice from Shoda from
experimentalist point of view

User name : guest

Password : toyamakamioka

Data Viewer

<http://seikai.hep.osaka-cu.ac.jp/~chino/cgi-bin/pastDataViewer.cgi>

Multi-Channel Analysis (Bruco)

<http://seikai.hep.osaka-cu.ac.jp/~chino/cgi-bin/multiChannelViewer2.cgi>

Correlation Analysis (Coherence, Peason)

<http://seikai.hep.osaka-cu.ac.jp/~chino/cgi-bin/multiChannelViewer.cgi>

Past Data Viewer

Date:

GPS Time: 1115097401

Local Time: 2015 Jan. 01 00:00:00 JST

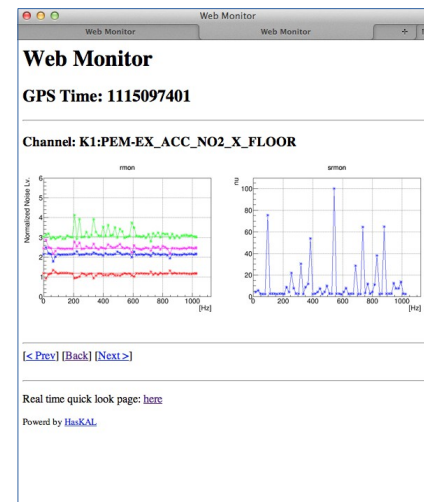
Duration: 32 sec.

Channel:

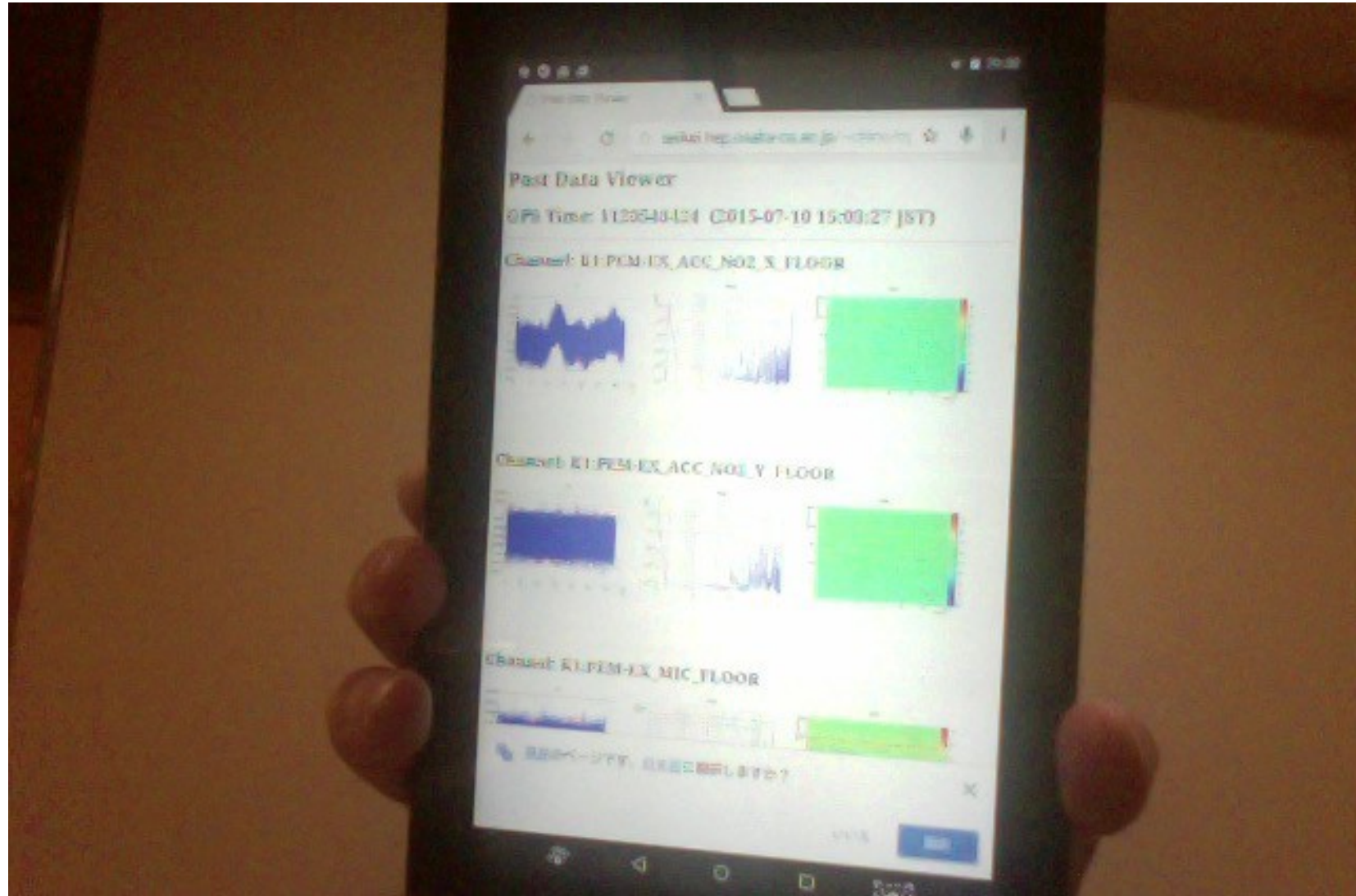
K1:PEM-EX_ACC_NO2_X_FLOOR
K1:PEM-EX_ACC_NO2_Y_FLOOR
K1:PEM-EX_ACC_NO2_Z_FLOOR
K1:PEM-EX_MAG_X_FLOOR
K1:PEM-EX_MAG_Y_FLOOR

Type:

Time Series
 Spectrum
 Spectrogram



Monitoring KAGRA Everywhere



Schedule

Toward iKAGRA

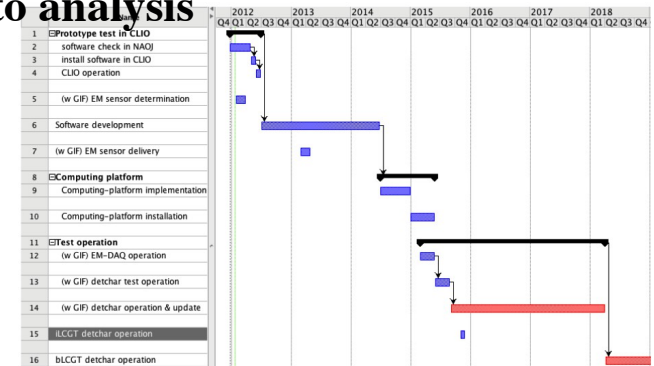
- The version of base compilers is frozen in Aug.
- Base software starts to be installed in the main machines from July.
- Test of the detchar system in the main machines starts from Aug.
- Recruit people

During iKAGRA

- Test of analyzed data flow
- Test of 50 channel monitoring
- Test of stable operation
- Noise hunting
- What kind of channels should be monitored for diagnostics and veto analysis

bKAGRA

- Integrating the experience into the systems.
- ...



Issue : Human resource

- **Currently, very limited human resource**
- **The web based tools help this issue.**
- **Hope one of each subsystem learn how to use detchar tools as early as possible**