

# **KAGRA**

## **Detector Characterization**

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**On behalf of KAGRA Detector Characterization**

# Interface

## **Data Analysis**

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

## **Detector Characterization**

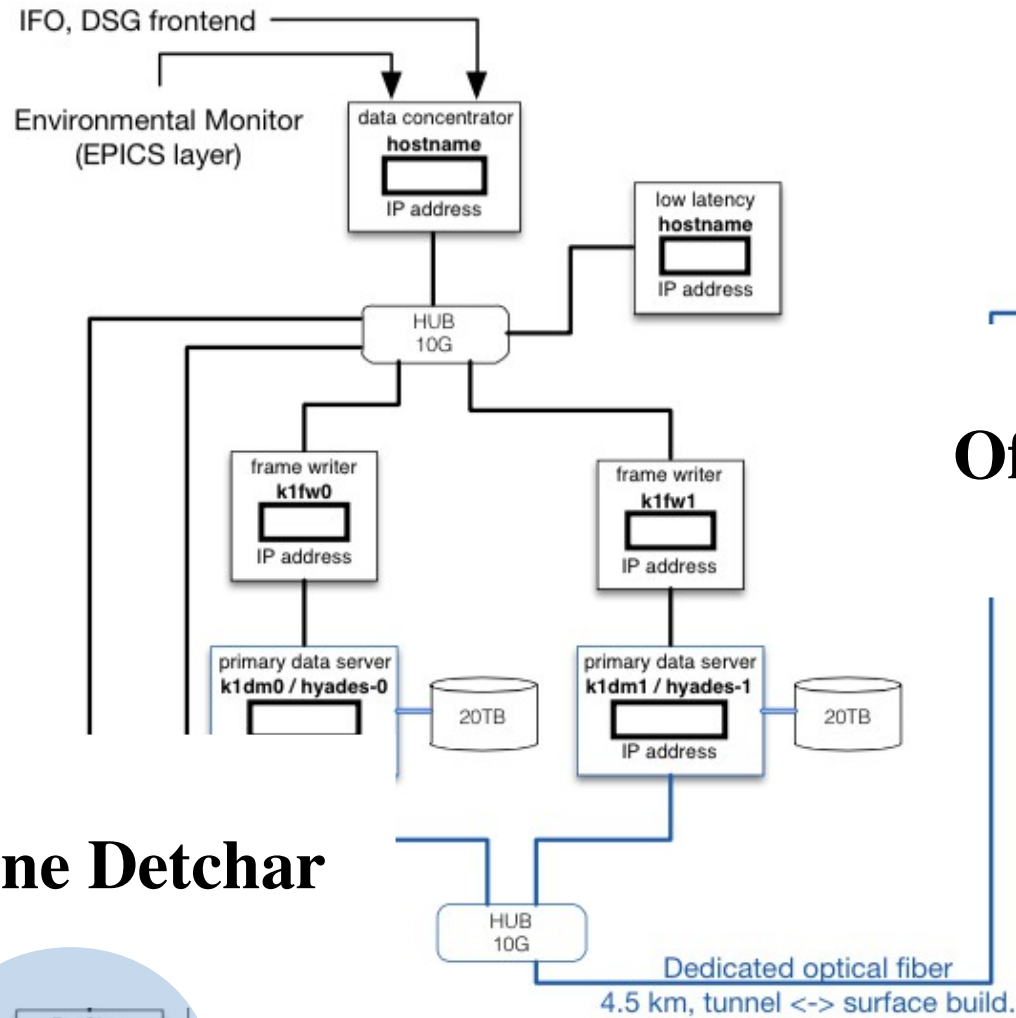
**PEM, Aux. channels, Online-monitors, diagnostics**

## **Instruments**

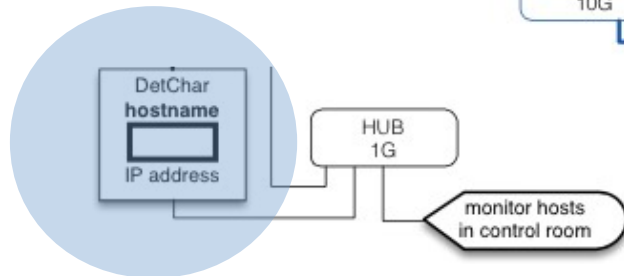
# Tasks

- **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 kind of EM, channels is 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**

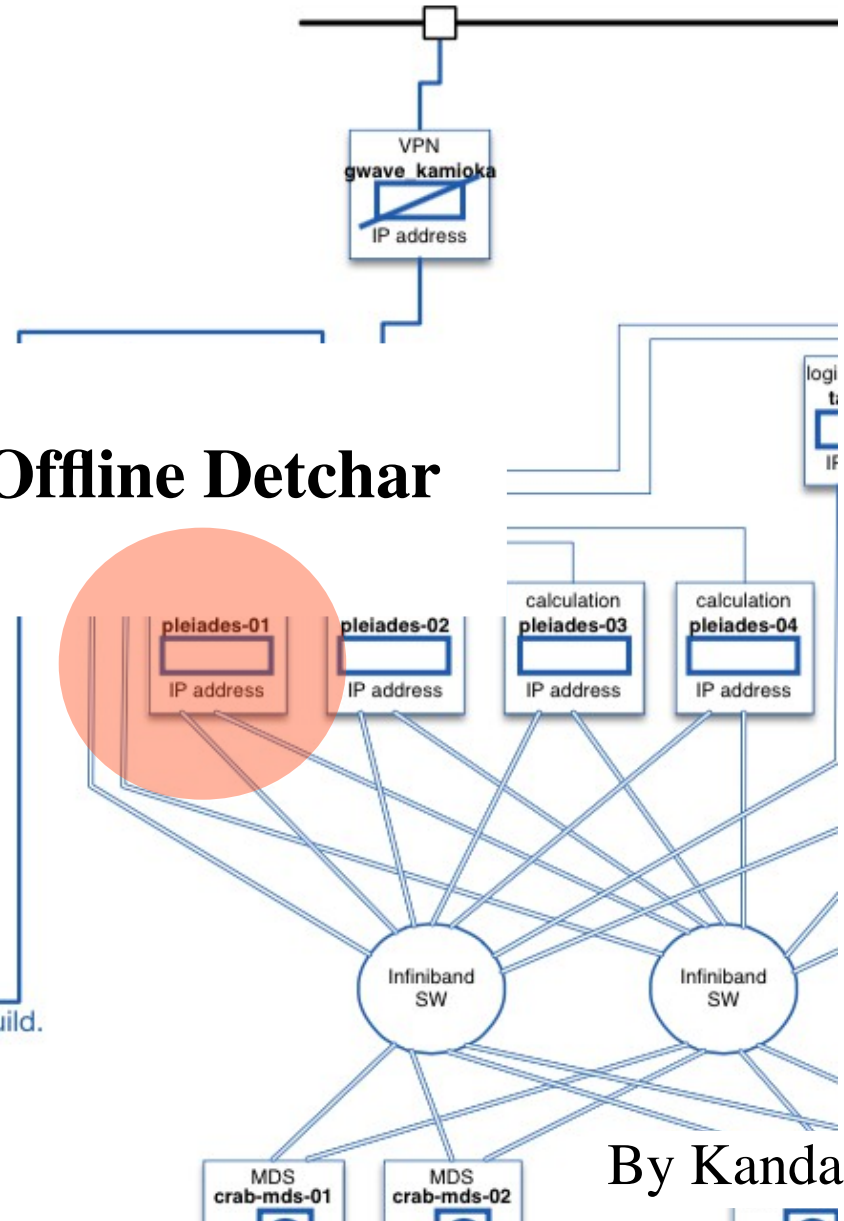
# Network



## 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



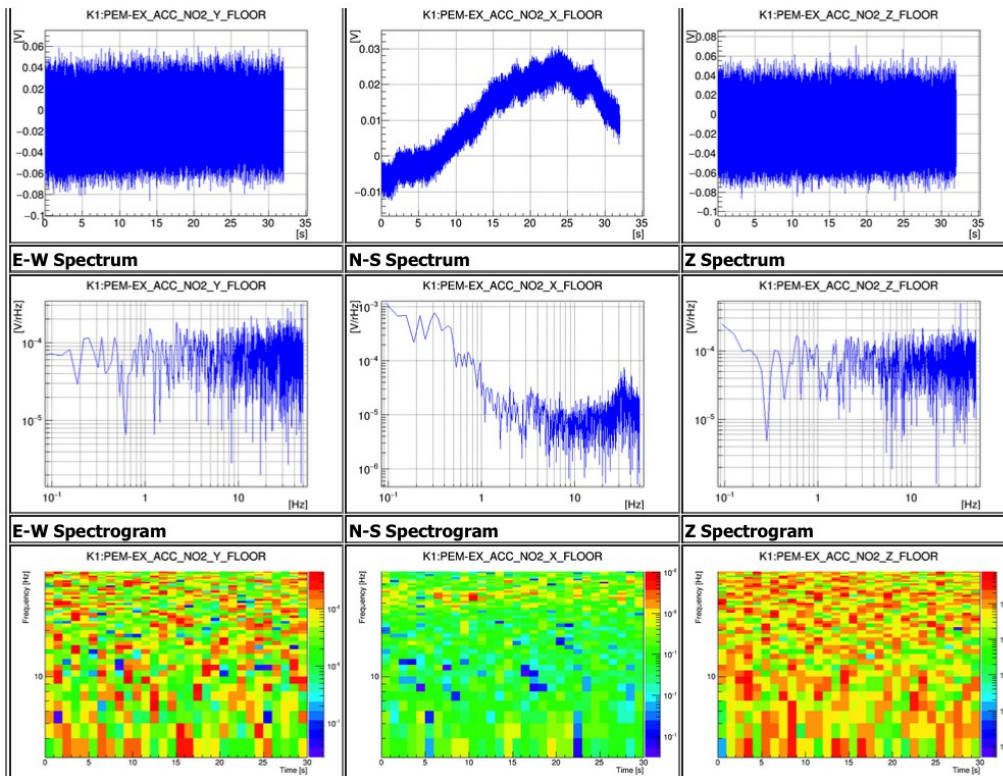
<https://github.com/gw-analysis/detector-characterization><sup>5</sup>

# Start Monitoring Environmental Activities @ X-end

With CRY, NAOJ, Kamioka Office

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.

**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:

☐ Local Time:

Duration:  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

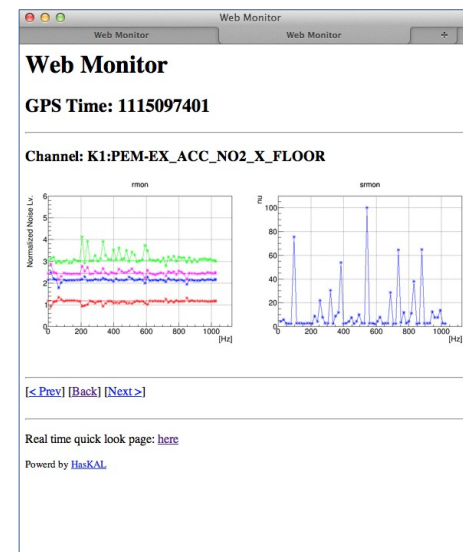
K1:PEM-EX\_MAG\_Y\_FLOOR

**Type:**

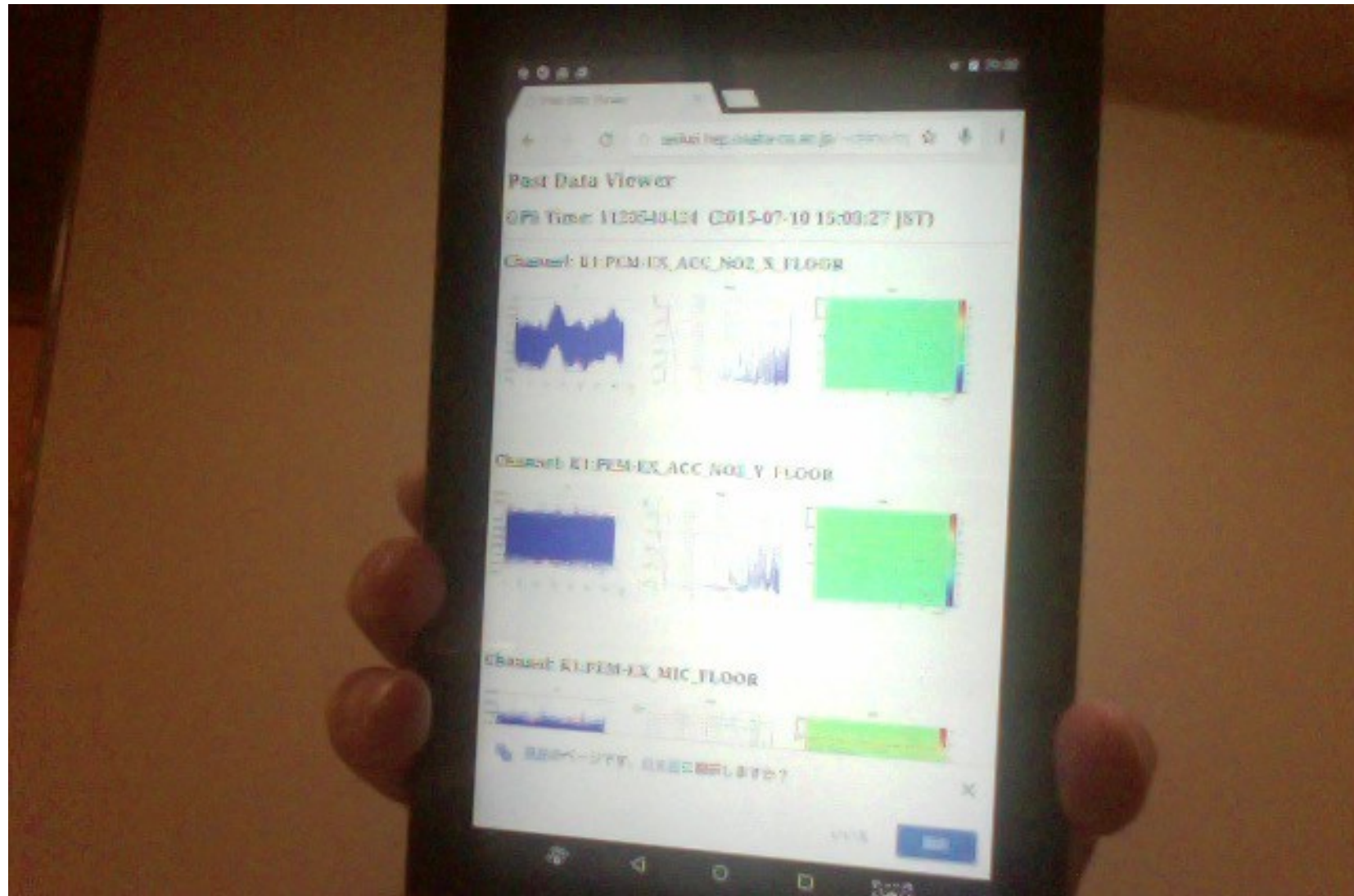
☒ Time Series

☒ Spectrum

☒ Spectrogram



# Monitoring KAGRA Everywhere





# Schedule

## Toward iKAGRA

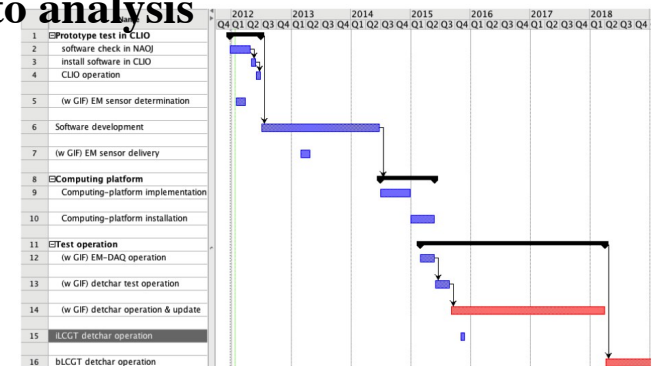
- The version of base compilers is frozen in Aug.
- Base software starts to be installed in the main machines from July.
- Test of the detchar system in the main machines starts from Aug.
- Recruit people

## 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**