

# **KAGRA**

## **Detector Characterization**

**Kazuhiro Hayama**

# Interface

## Data Analysis

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

## Detector Characterization

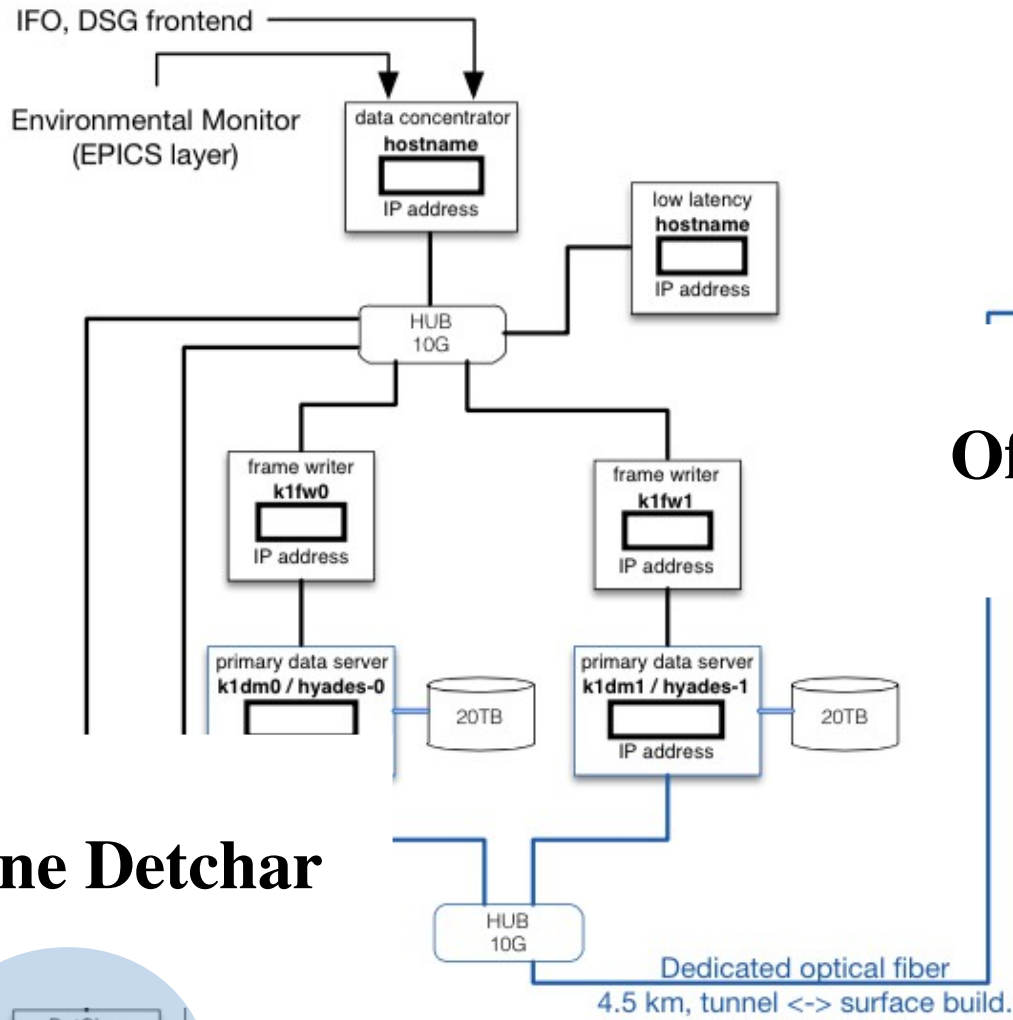
PEM, Aux. channels, Online-monitors, diagnostics

## Instruments

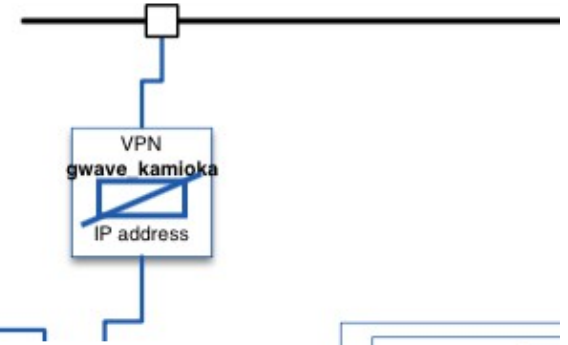
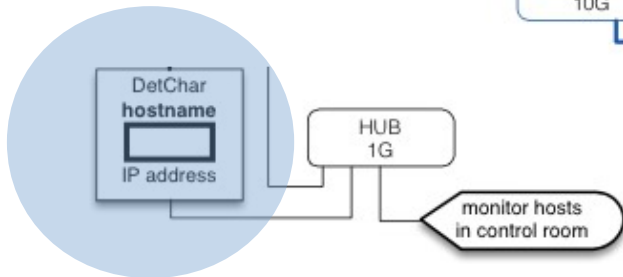
# Tasks

- **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**
- **Observation phase**
  - **To provide data quality flags to the GW search group**
  - **To perform veto analysis using the data quality and multi-variate analysis**

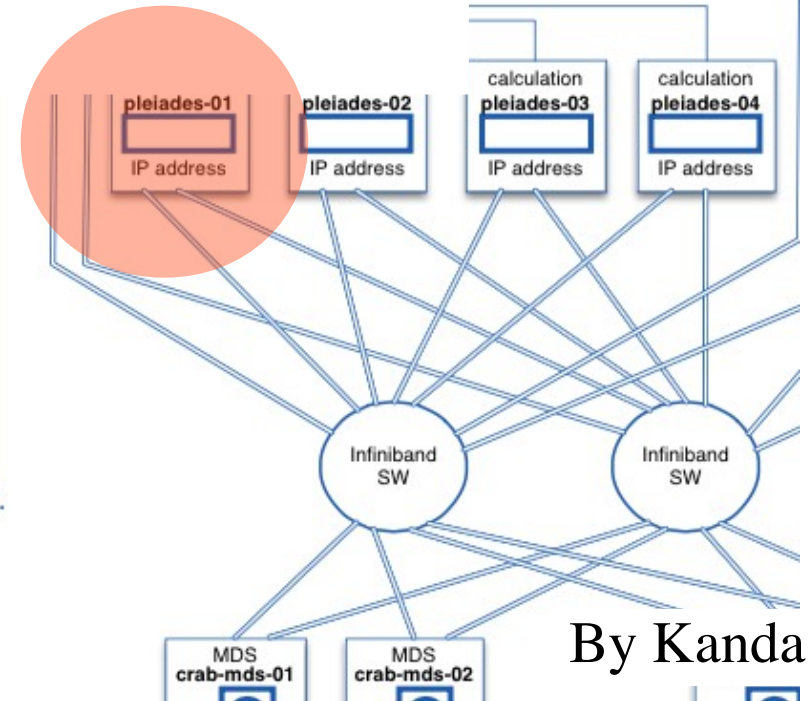
# Network



## 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

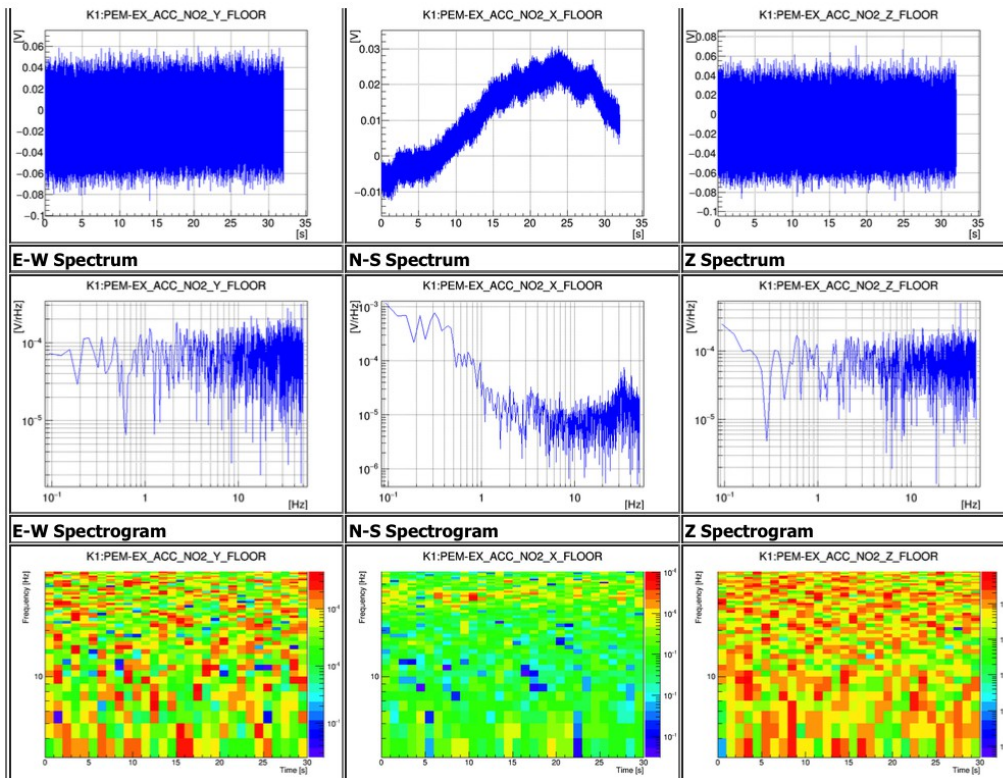


<https://github.com/gw-analysis/detector-characterization><sup>5</sup>

# Start Monitoring environmental activities @ X-end

DAQ system

Quick Look Webpage



# Most of things can be done through Web

## Open Web site, that's it!

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:       JST

Duration:  sec.

**Channel:**

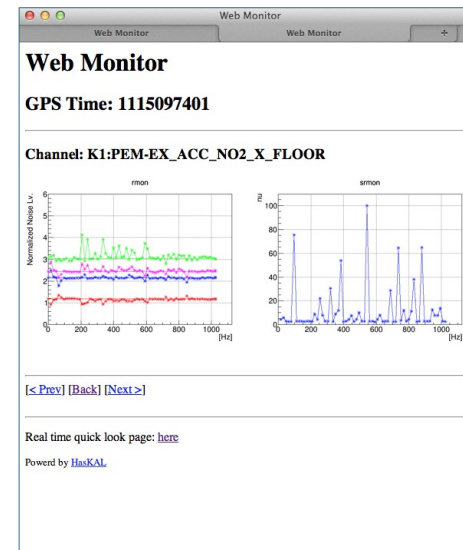
K1:PEM-EX\_ACC\_NO2\_X\_FLOOR  
K1:PEM-EX\_ACC\_NO2\_Y\_FLOOR  
K1:PEM-EX\_ACC\_NO2\_Z\_FLOOR  
K1:PEM-EX\_MAG\_X\_FLOOR  
K1:PEM-EX\_MAG\_Y\_FLOOR

**Type:**

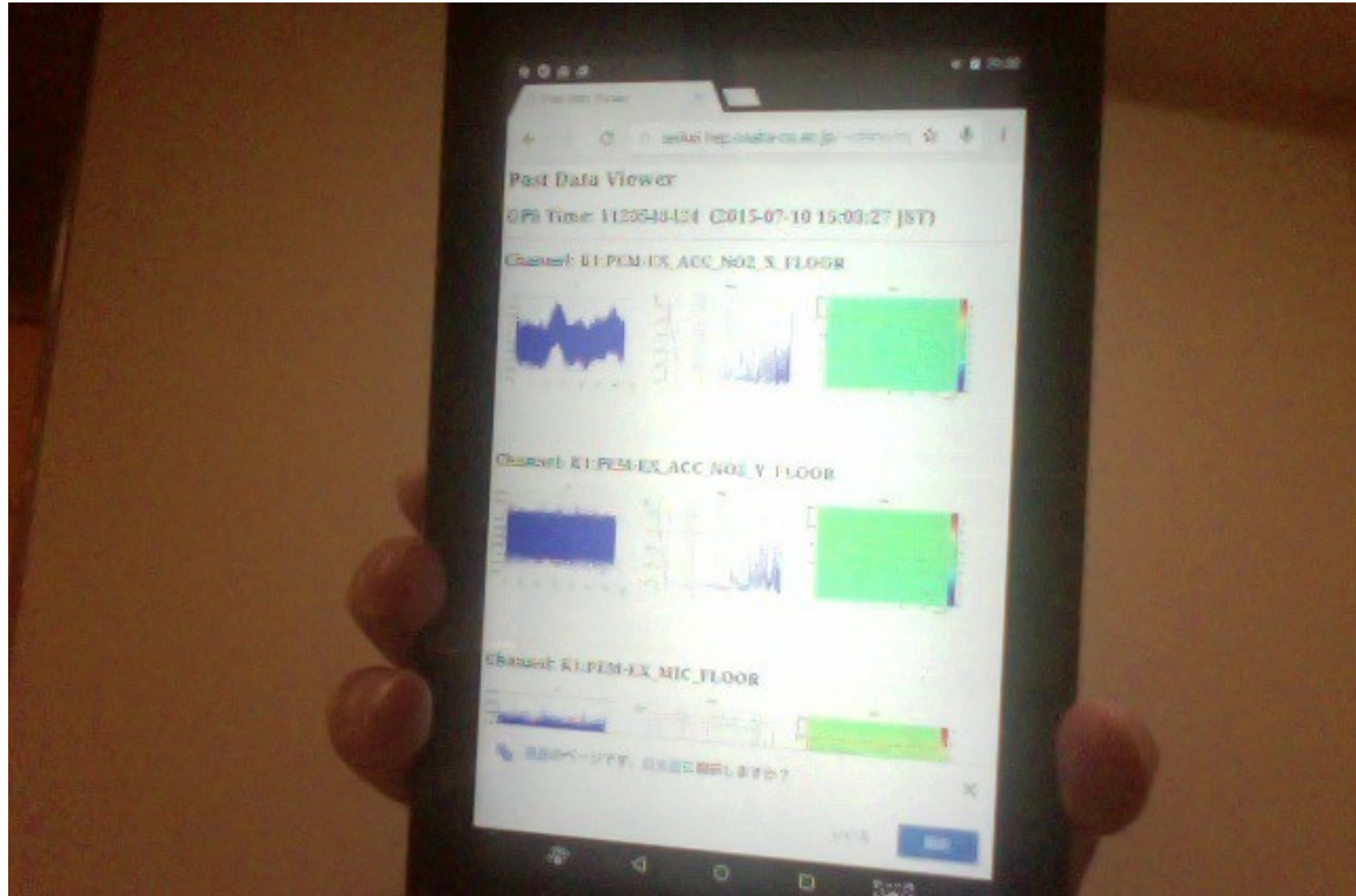
Time Series

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.

## During iKAGRA

- Test of analyzed data flow
- Test of 50 channel monitor
- 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.
- ...

