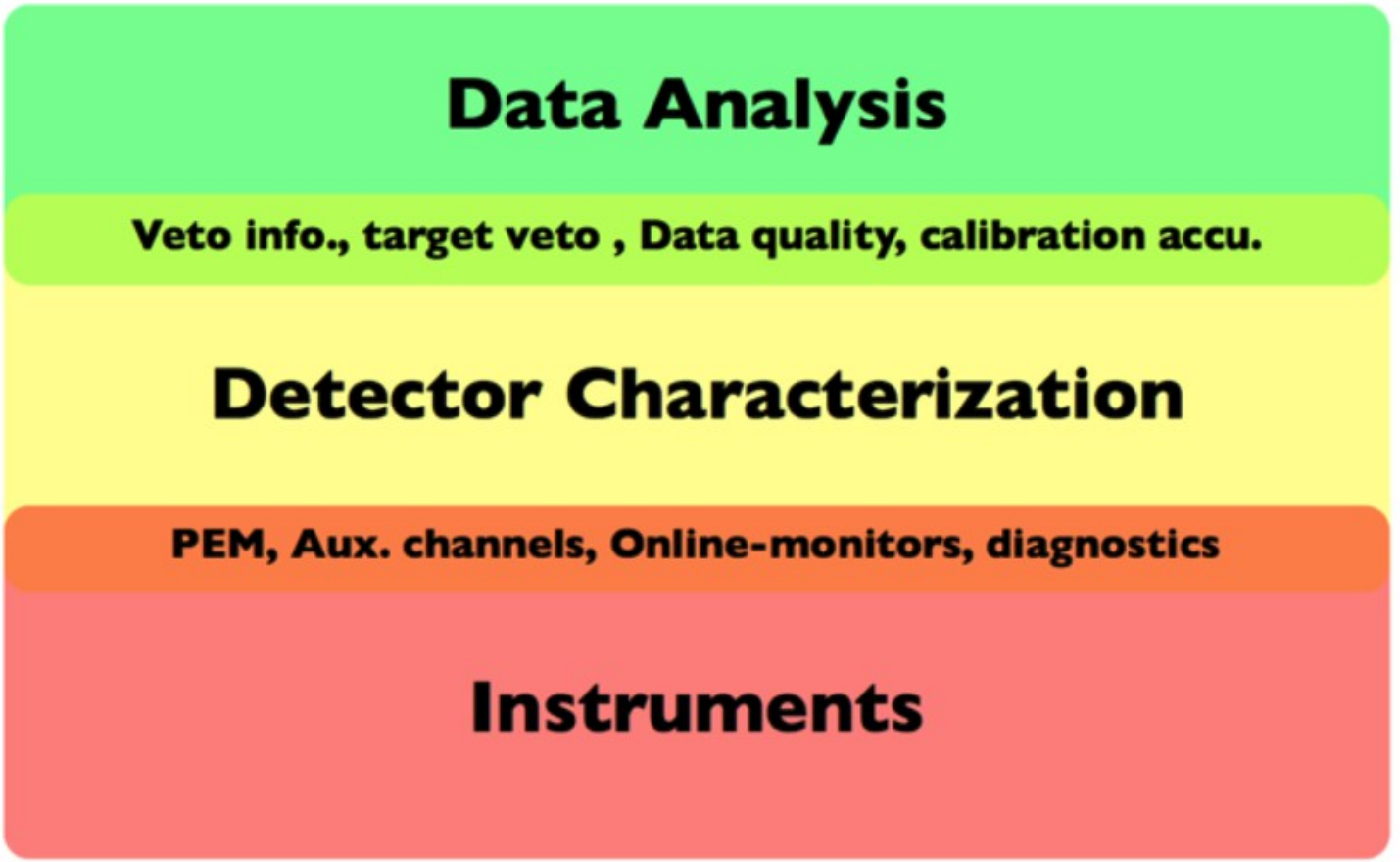
Detector Characterization

Kazuhiro Hayama
on behalf of KAGRA detector characterization group

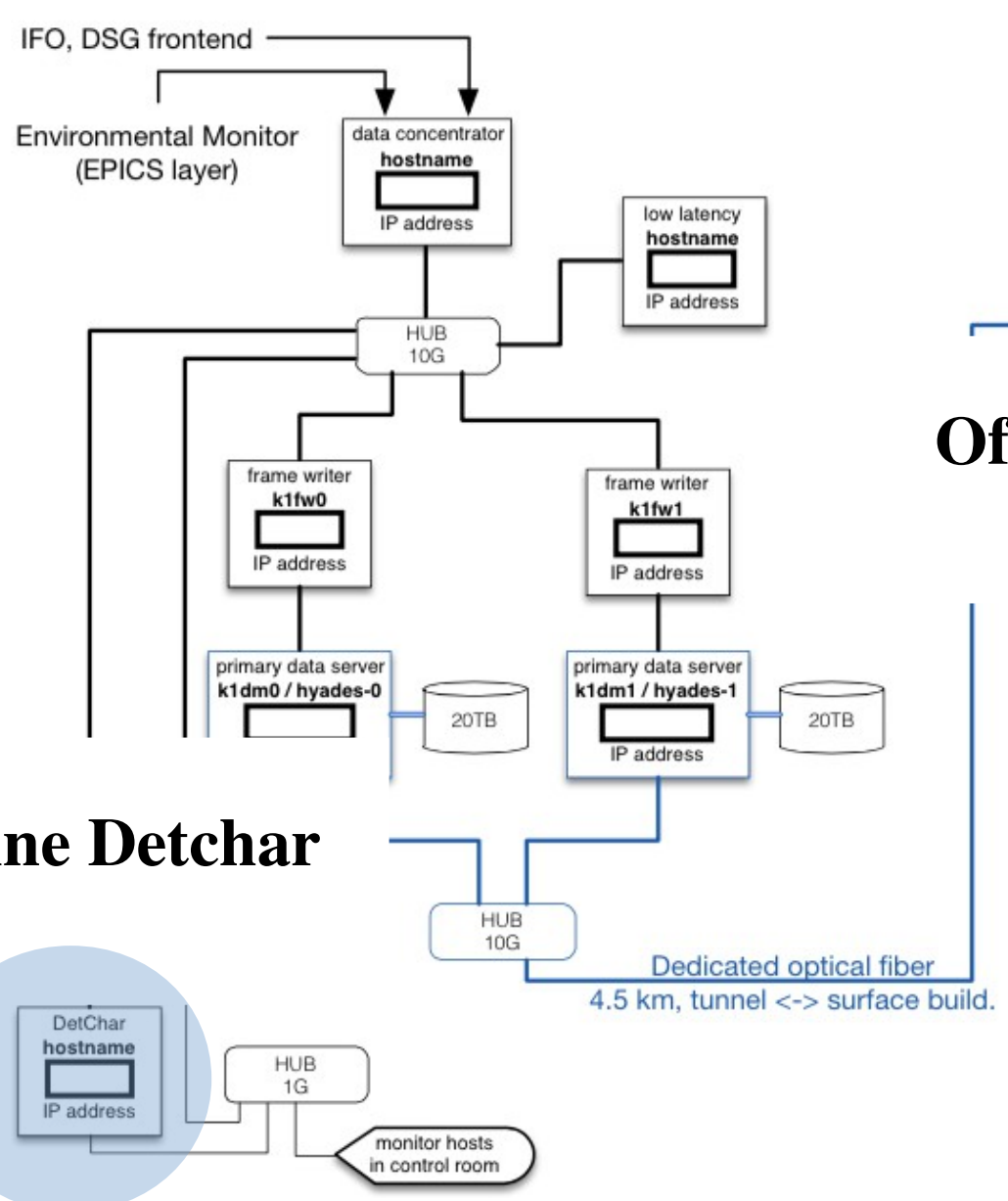
Interface


Data Analysis
Veto info., target veto , Data quality, calibration accu.
Detector Characterization
PEM, Aux. channels, Online-monitors, diagnostics
Instruments

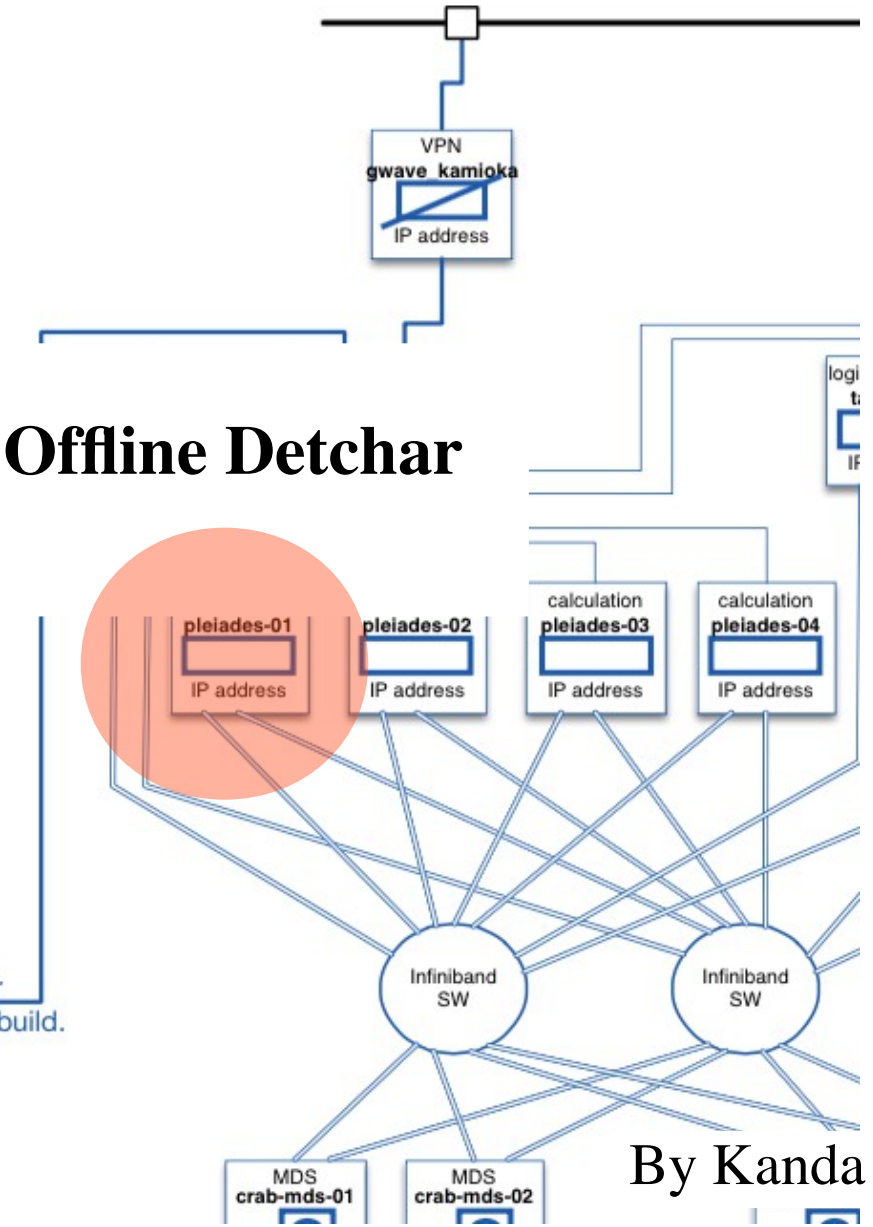
Tasks

- **Commissioning phase**
  - **To monitor whether data is normal or not**
  - **To localize noise sources which prevent KAGRA from reaching the design sensitivity.**
    - **To find correlations between PEM channels.**
    - **To find non-stationary noise events, oscillations**
    - **…**
  - **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

Installation

- **Hardware has been installed both in the mine and analysis building. The workstation has been confirmed to work, but after installation in the mine, setting is not yet done.**
- **Software to be installed is under development, adjustment.**

Development

- **The software is being developed and tested in two platforms:**
  - **One is in the Kamioka analysis building.**
  - **Another one is in the Osaka-City university.**
- **Web-based monitoring system is being tested and developed in connection with the environmental sensors (seismometer, magnetometer, microphone) running at X-End of KAGRA**
- **Consulting with subsystems what parts of systems should be monitored with sensors (what kinds of sensor?)**

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

Schedule

Toward iKAGRA

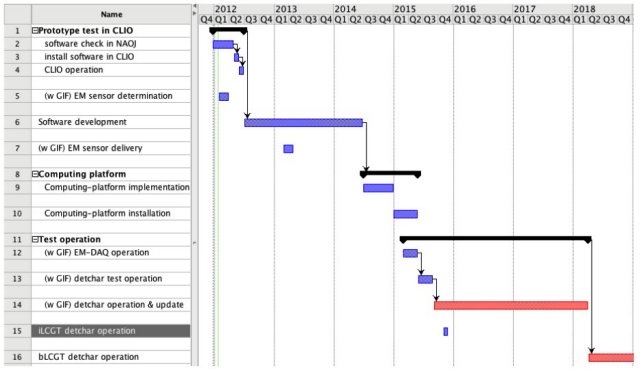
- The version of base compilers is frozen in Aug.
- Base software starts to be installed in the main machines from July.
- Test of the detchar system in the main machines starts from Aug.

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.
- ...



Optional slides

HasKAL
Detector Characterization Analysis Tools

upload MBLT items

asano0622 authored 9 days ago — latest commit 9fa358144c

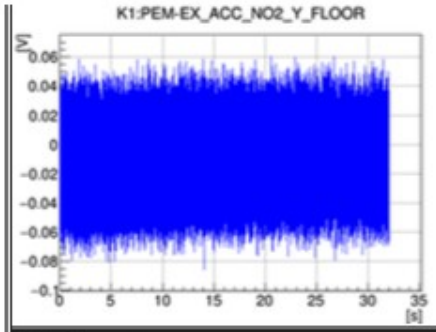
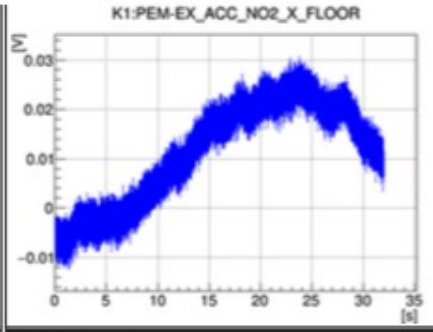
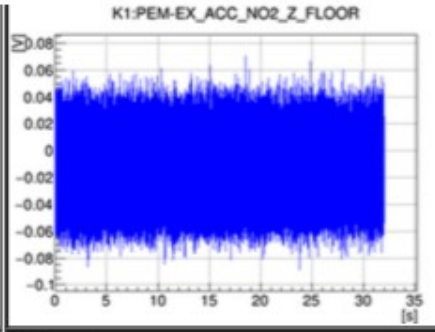
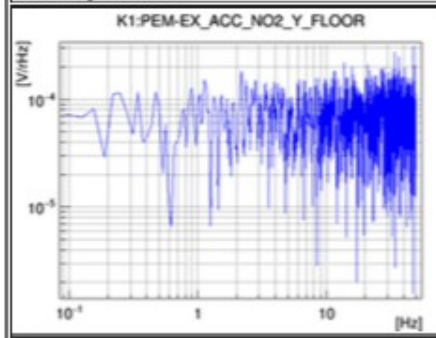
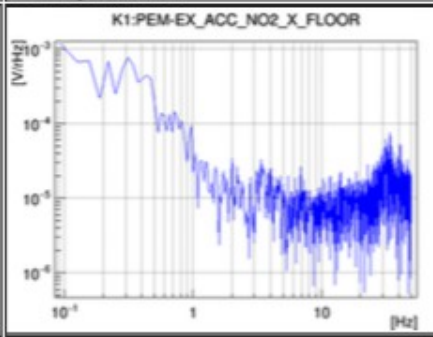
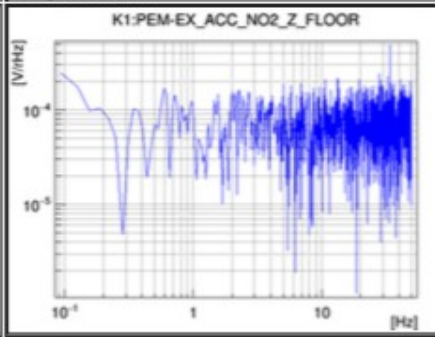
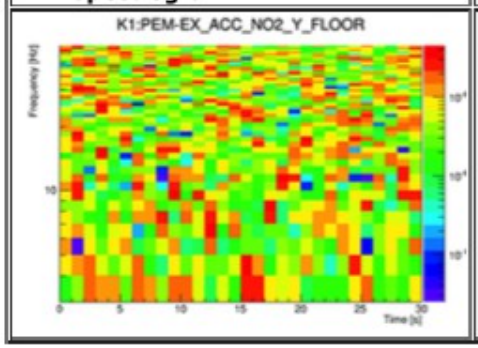
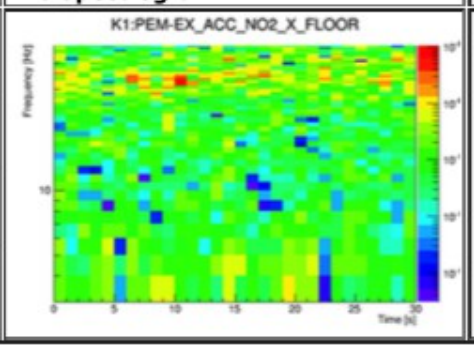
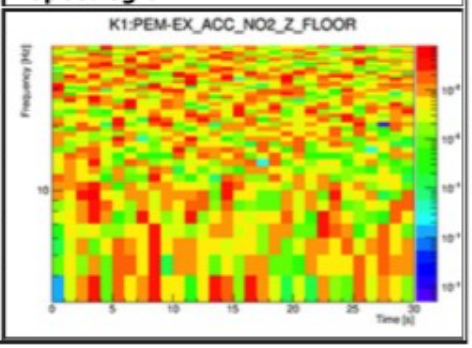
..		
DetectorUtils	working around injection	19 days ago
ExternalUtils	Mine.hs updated	14 days ago
FrameUtils	small change	11 days ago
GUI_Utils	changed GUI_Utils for plot tool update	11 days ago
LineUtils/LineRemoval	upload MBLT items	9 days ago
Misc	move haskalOpt to Environment module	2 months ago
MonitorUtils	change plot tool of RayleighMon from Chart to HROOT	14 days ago
PlotUtils	modified plot tool	11 days ago
SearchUtils	added SearchUtils	22 days ago
SignalProcessingUtils	minor update	13 days ago
SimulationUtils	add injection function which uses bang method for memory saving	18 days ago
SpectrumUtils	minor change of DetectorSensitivity	11 days ago
StatisticsUtils	change module name	13 days ago
TimeUtils	change function fromGPS to deformatGPS	19 days ago
WaveUtils	add dropWaveData, takeWaveData	13 days ago
DetectorUtils.hs	added module of modules	2 months ago
TimeUtils.hs	added module-setting module	19 days ago
WaveUtils.hs	added a module-setting file	19 days ago

https://github.com/gw-analysis/detector-characterization

Ouick Look Web

Quick Look of Environmental Activities

UTC Time : 2015-05-07 04:53:29 UTC

E-W Time-Series	N-S Time-Series	Z Time-Series
		
E-W Spectrum	**N-S Spectrum**	**Z Spectrum**
		
E-W Spectrogram	**N-S Spectrogram**	**Z Spectrogram**
		

Most of things can be done through Web

Open Web site, that's it!

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

plot view

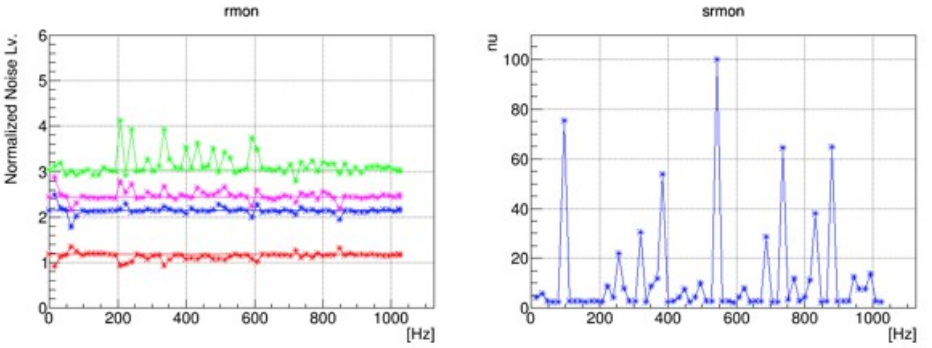
Web Monitor

Web Monitor | Web Monitor

Web Monitor

GPS Time: 1115097401

Channel: K1:PEM-EX_ACC_NO2_X_FLOOR



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Real time quick look page: here

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