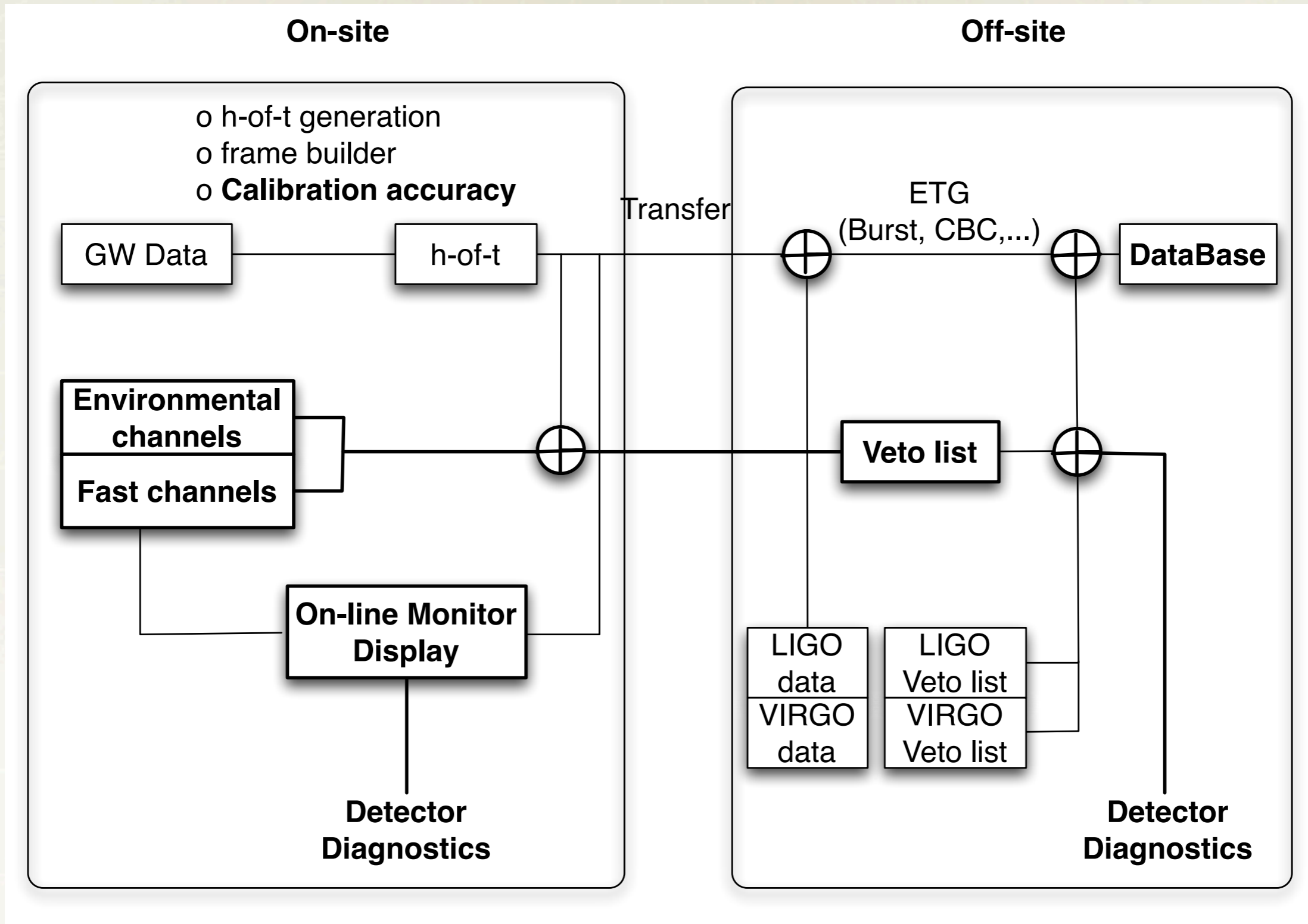


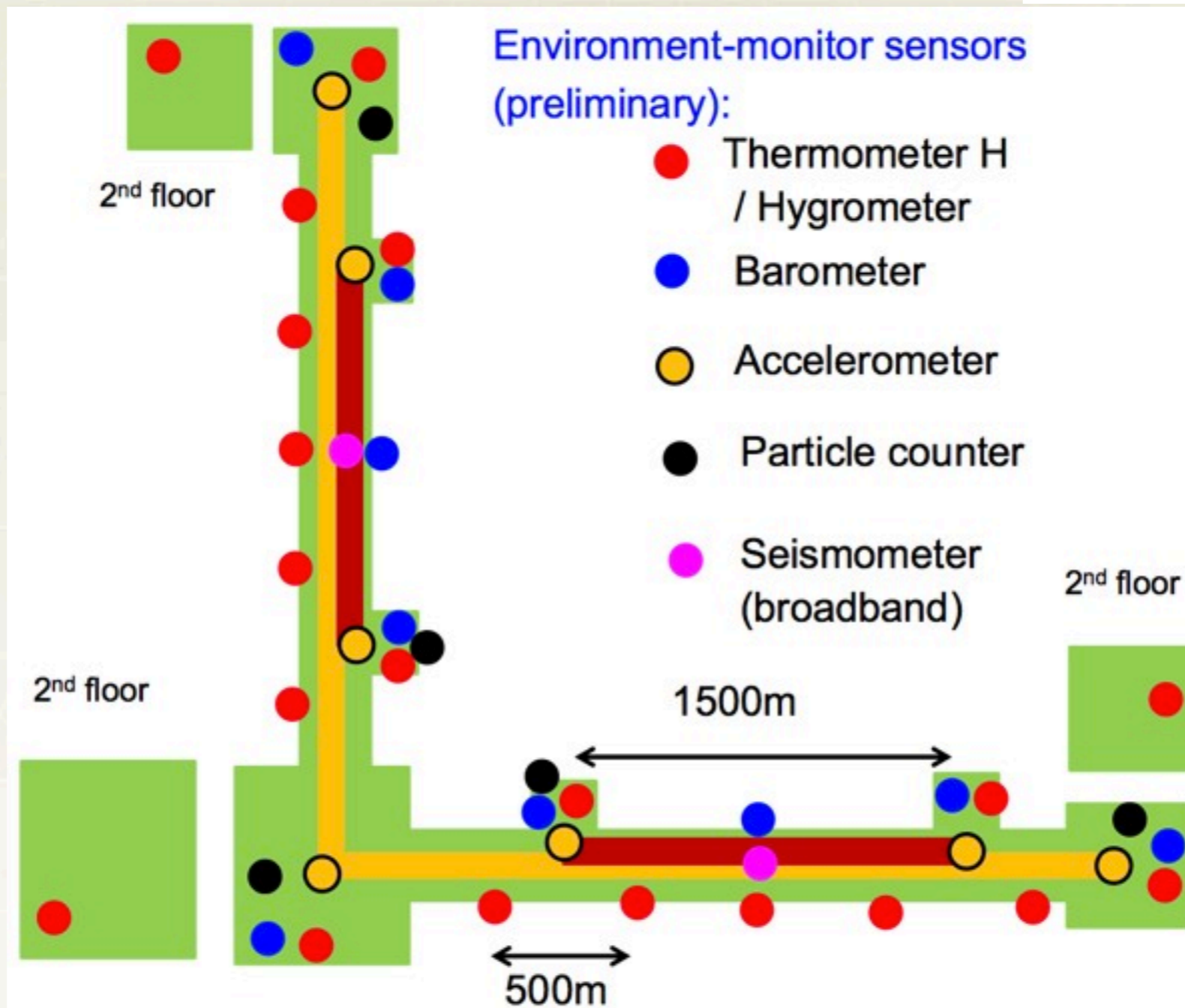
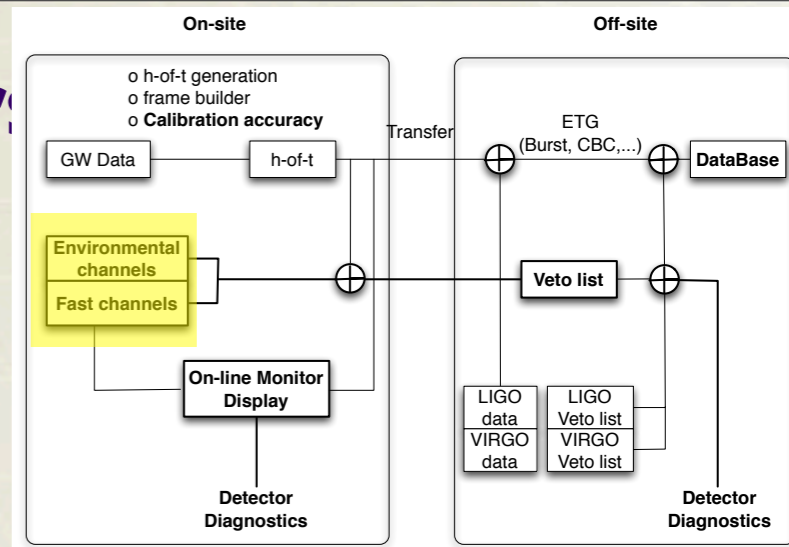
Current status of Detector Characterization

**Kazuhiro Hayama on behalf of
the research team**

- **Determine which data segment is available for science.**
- **Detector diagnostics. Killing noise sources. Improvement to instruments. The best way is to kill noise sources before LCGT observing.**
- **Construction of detchar system in a pre-process server.**
- **Evaluation/setting of EMs with GIF**
- **Veto list: number should be one-to-one correspondence**
- **Distribution of veto list to other collaborations.**
- **Influence of the accuracy of calibration on h-of-t reconstruction.**
- **The unique information of LCGT should be taken care with detchar and distributed so that other collaborators are not concerned about it to some extent.**



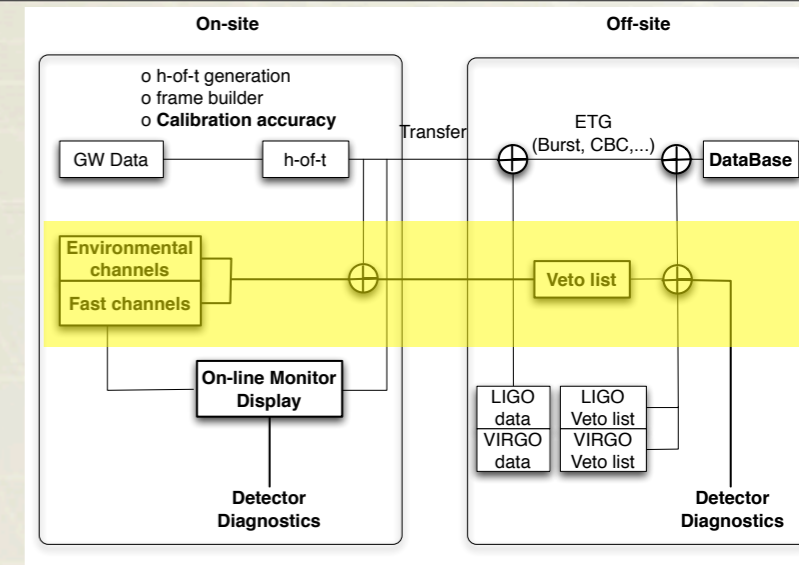
- Environmental monitor sensors
- Number, type will be decided in this year.



should add magnetometers to Ends, Center

Seismometers at Ends?

Veto-list generation



- **Data quality information**
- **Real-time segment generation**
Data quality information of science mode, lock, calibration,...
soft : DMT(data monitoring tool)
- **Segment database**
- **Triggered event database**
- **Real-time veto analysis**
- **soft:** critical coupling likelihood method, bispectral analysis, hveto, ...
- **Channel information system**
- **Validation tools for segment**
- **Daily Report tool**



(cont'd) Veto-list : Target sources

Transient GW search (CBC, Burst)

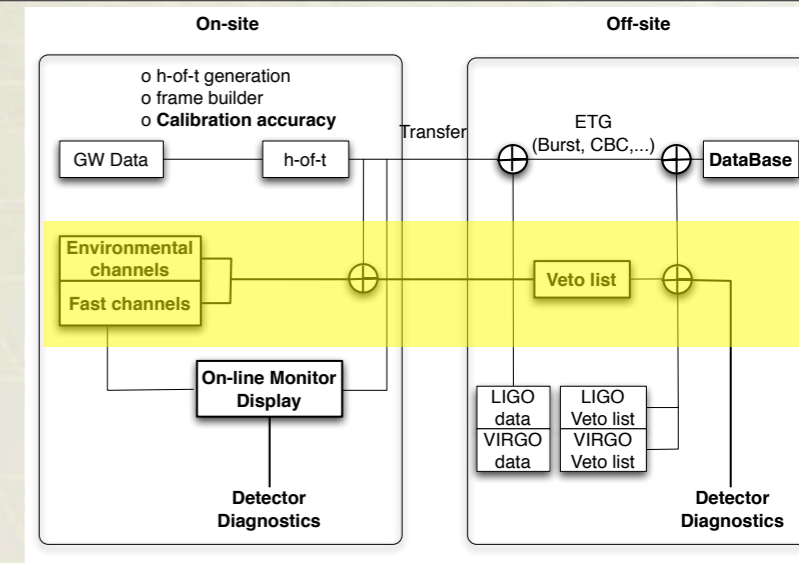
- **Real-time glitch detection**
- **Glitch classification**
- **Coincidence analysis between the GW channel and auxiliary sensor channels.**
- ...

Continuous GW search (pulsar, LMXB)

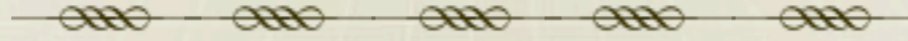
- **Line tracking**
- **Line detection**
- **Removal of high frequency spikes**
- ...

Stochastic GW search (Early univ, ...)

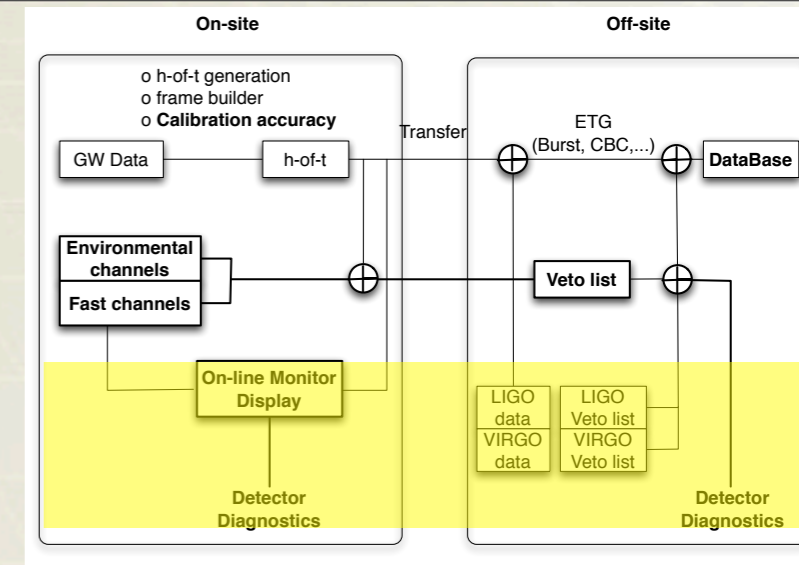
- **Noise Floor monitor**
-



Detector diagnostics



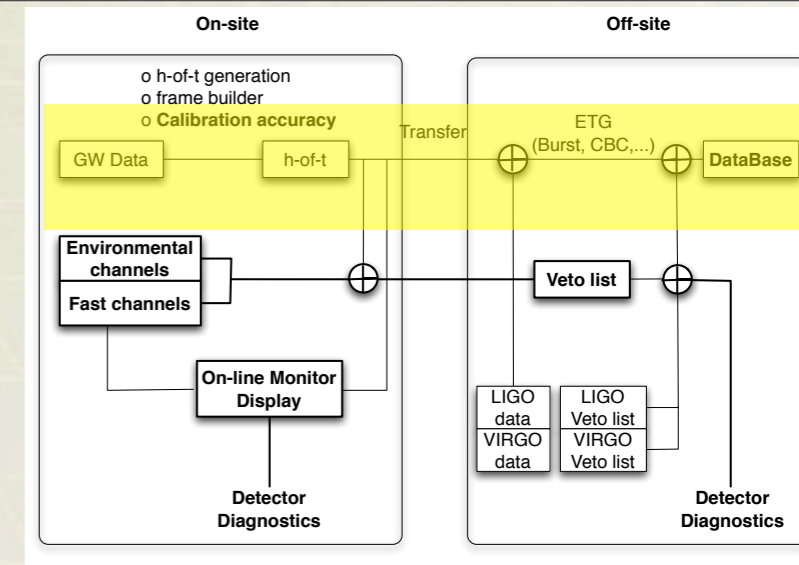
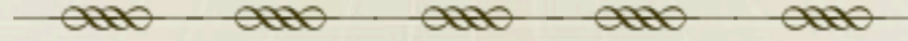
Provide information of data quality, non-stationary components, monitoring tools.



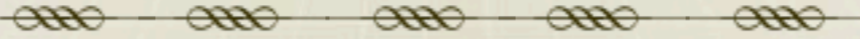
- **Glitch detection pipeline**
soft : **Omega**
- **Coincidence analysis between channels, channel and h-of-t,...**
Find correlation between channels,
soft : **CCL, hveto, multivariate statistics,...**
- **Noise floor monitor tool**
soft : **noisefloormon**
- ...



Calibration accuracy



- **Hardware injection test**
soft :
- **Waveform reconstruction**
soft : cWB, Omega, RIDGE, ...



I. **Prototype test in CLIO**

- o **Installation test of base detchar system at NAOJ and soft development.**
- o **Operation test of base detchar system during CLIO operation.**
- o **Software development**

II. **Computation platform**

- o **2Q-4Q2014: Implementation of detchar system in a pre-process server.**
- o **1Q-3Q2015: Installation of the pre-process server to a building.**

III. **Test operation**

- o **Test operation of the detchar system when EM operation in GIF ~March in 2015.**
- o **Operation of the detchar system during GIF operation from ~ June, 2015.**
- o **Operation during iKAGRA in ~ Nov. 2015.**
- o **Software development**

IV. **Operation**

- o **Operation during bKAGRA from ~ Aug. 2018.**

- **Import of LVC software**
 - **Data quality monitor**
 - **Glitch detection pipeline**
 - **Coincidence analysis pipeline**
- **New software requirement / sophistication**
 - **Glitch classification**
 - **Noise modeling (glitch and power spectrum)**
 - **Tools to know when and how glitches shows up?**

Application of ANNs to Glitch Identification Study using Auxiliary Channels

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Chang-Hwan Lee², Ruslan Vaulin³, Lindy Blackburn⁴

¹ National Institute for Mathematical Sciences ² Pusan National University

³ MIT ⁴ Goddard Space Flight Center, NASA

Goals: Applying artificial neural networks (ANNs) to auxiliary channel information,

- ◆ Provide a highly efficient and reliable noise transient (glitch) identification tool
- ◆ Develop a method to trace down the culprit channel(s) causing noise transient in strain data
- ◆ Potentially establish a new ranking statistic useful for CBC search

