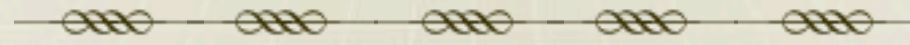


Report on detector characterization

Kazuhiro Hayama
detector characterization team



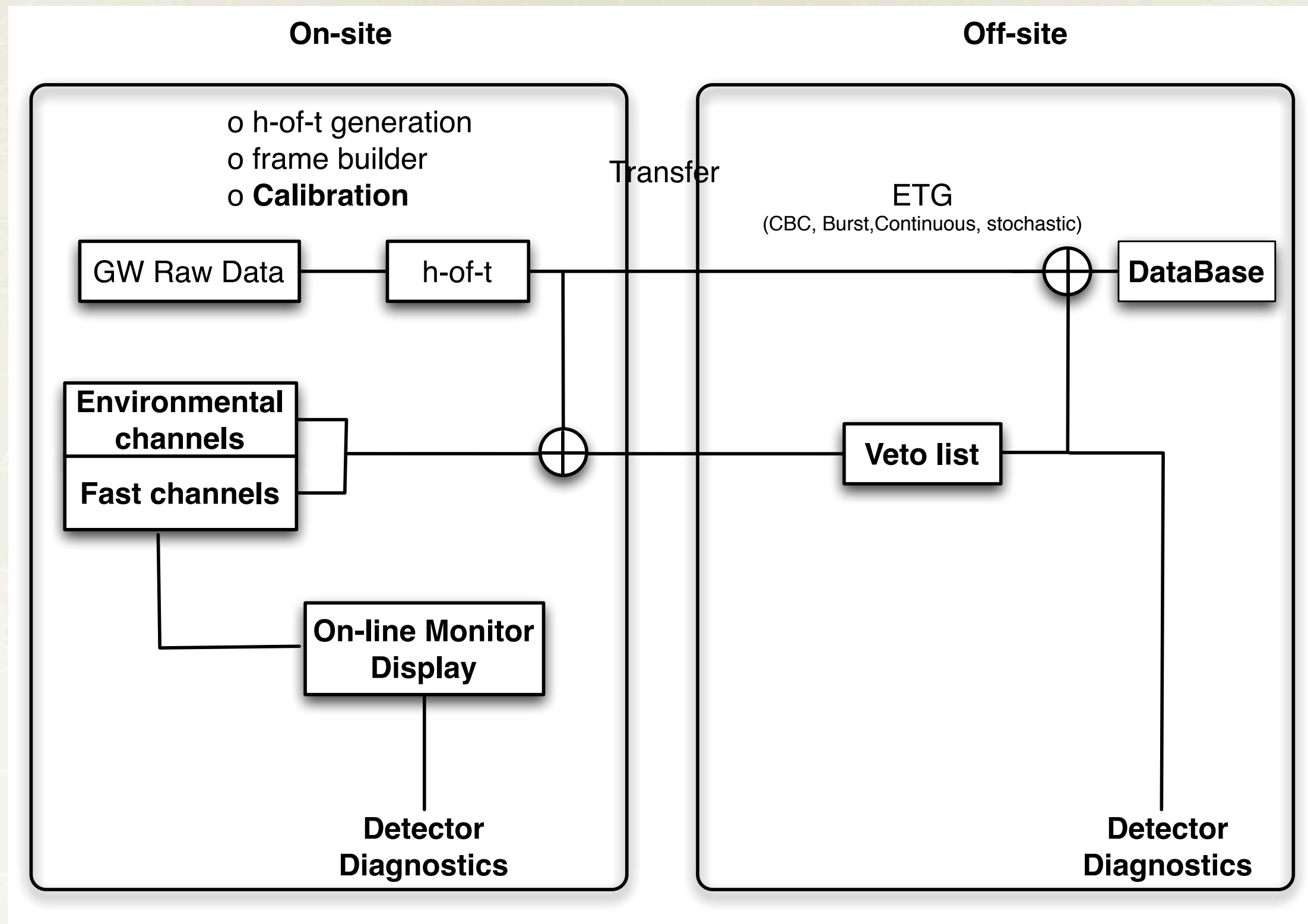
Commissioning stage

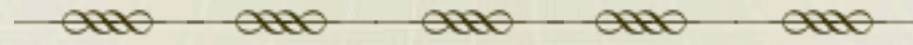
With each subsystem,

-  Tools for subsystem diagnostics
-  Support to kill noise sources
-  Calibration (with MIF, DGS, DMG etc)

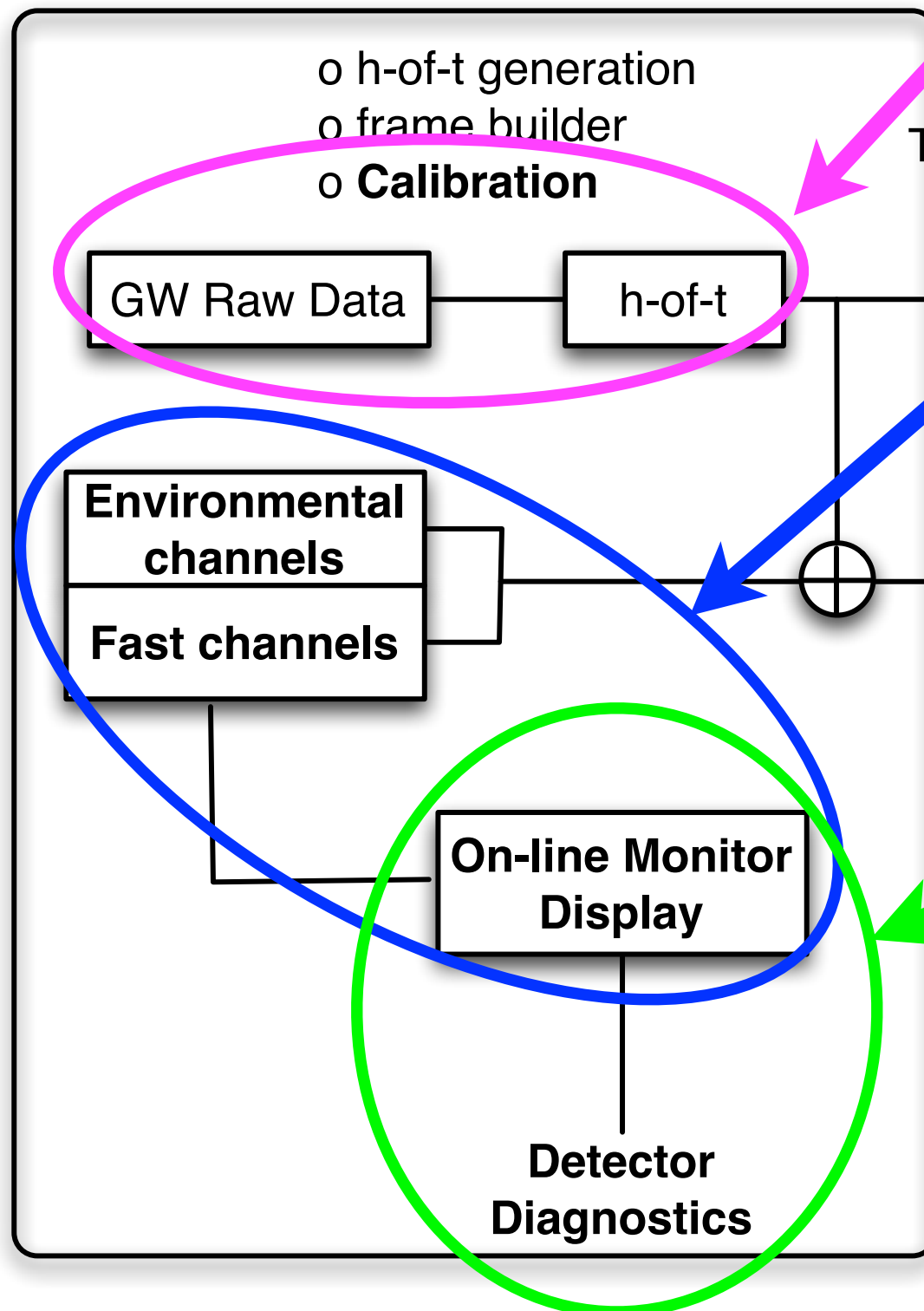
Observation stage

-  Veto analysis (rejection of glitches)
-  Noise modeling to improve false alarm rate





On-site



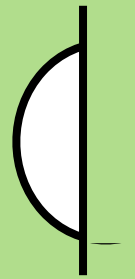
Time domain calibration

On-line display of auxiliary, PE, GW channels

Hardware injections
(GW-Seis mon correlated)

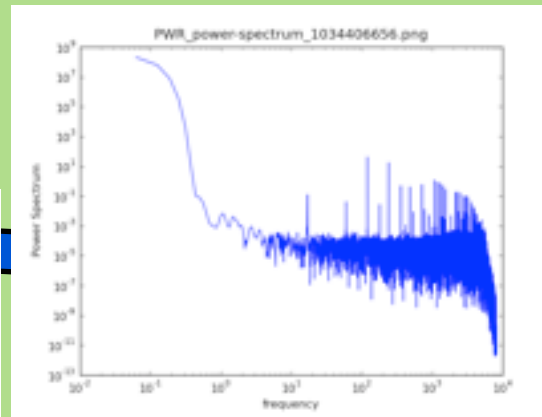
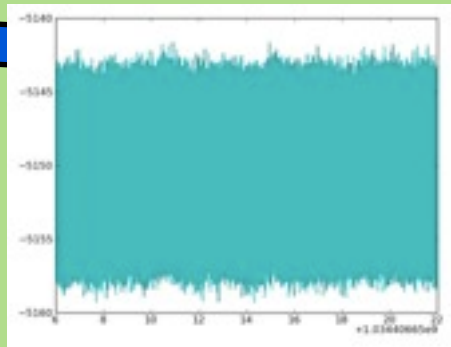
Detector Characterization

Inst. Mon



Laser Intensity

16s

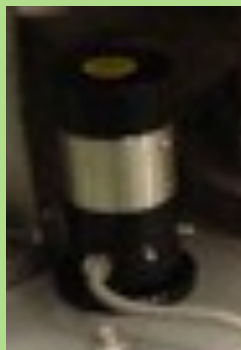


RT WS



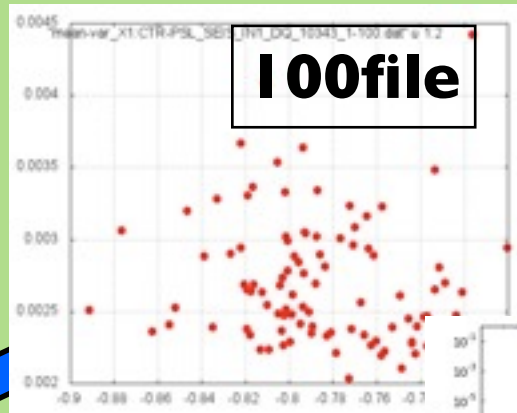
**RealTime
update @16s**

Env. Mon

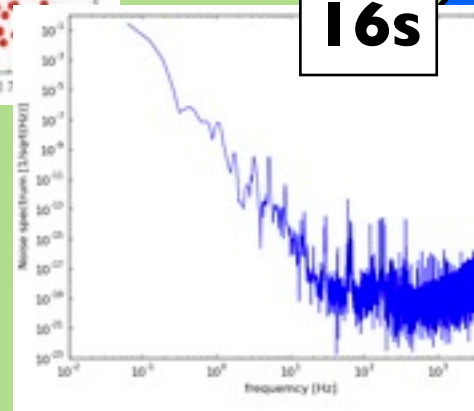


acce.

100file



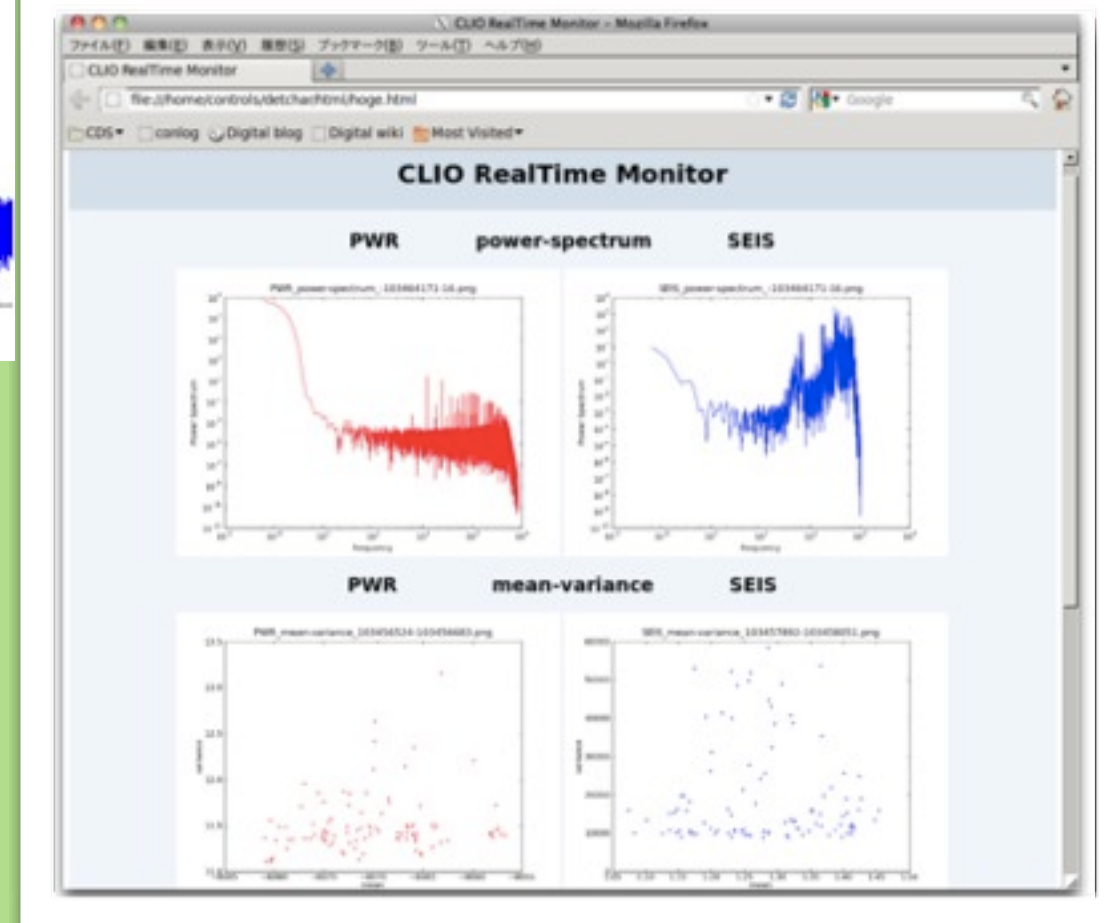
16s



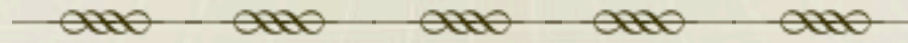
Sens. Mon



CLIO



K.Tanaka



Calibration

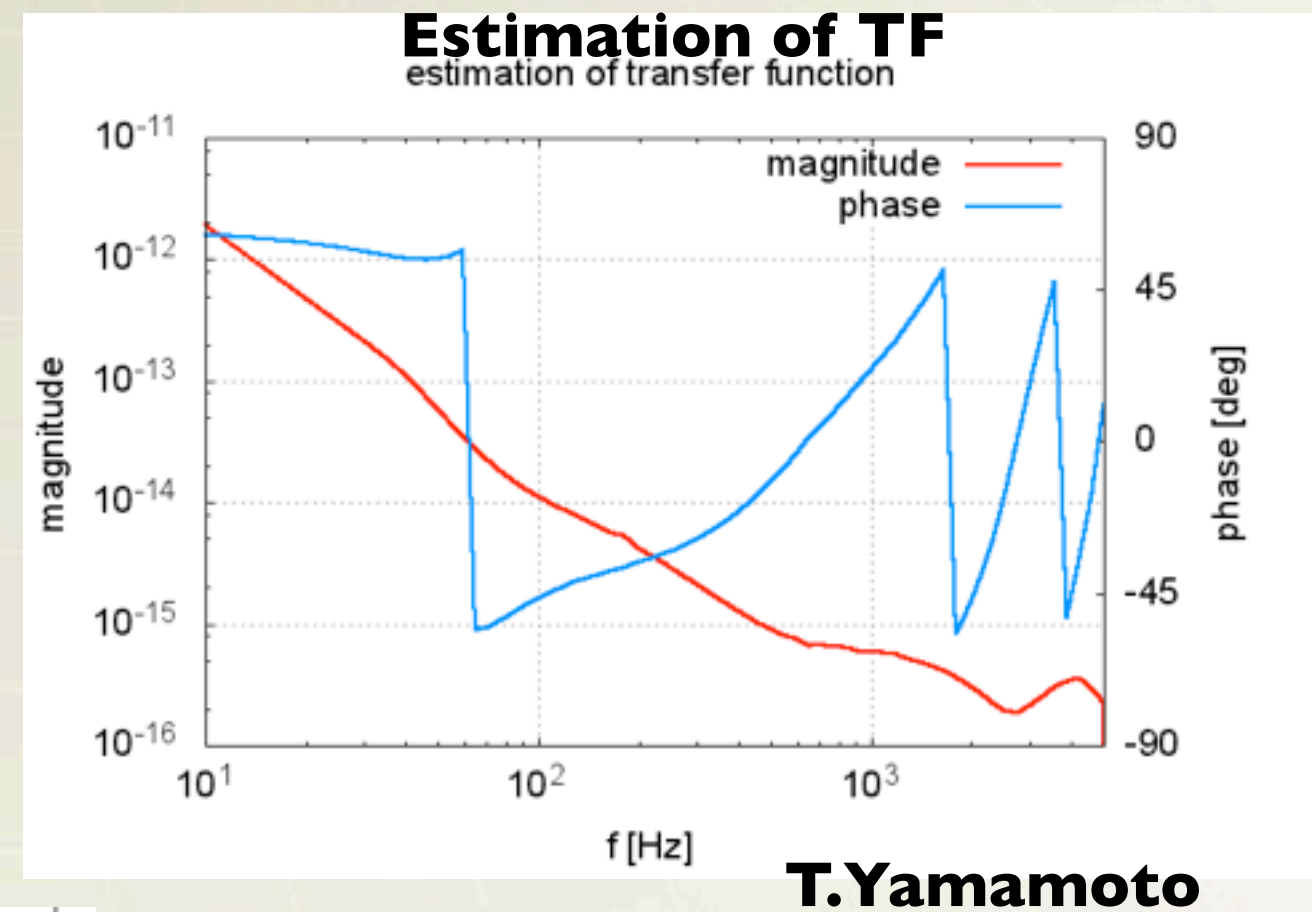
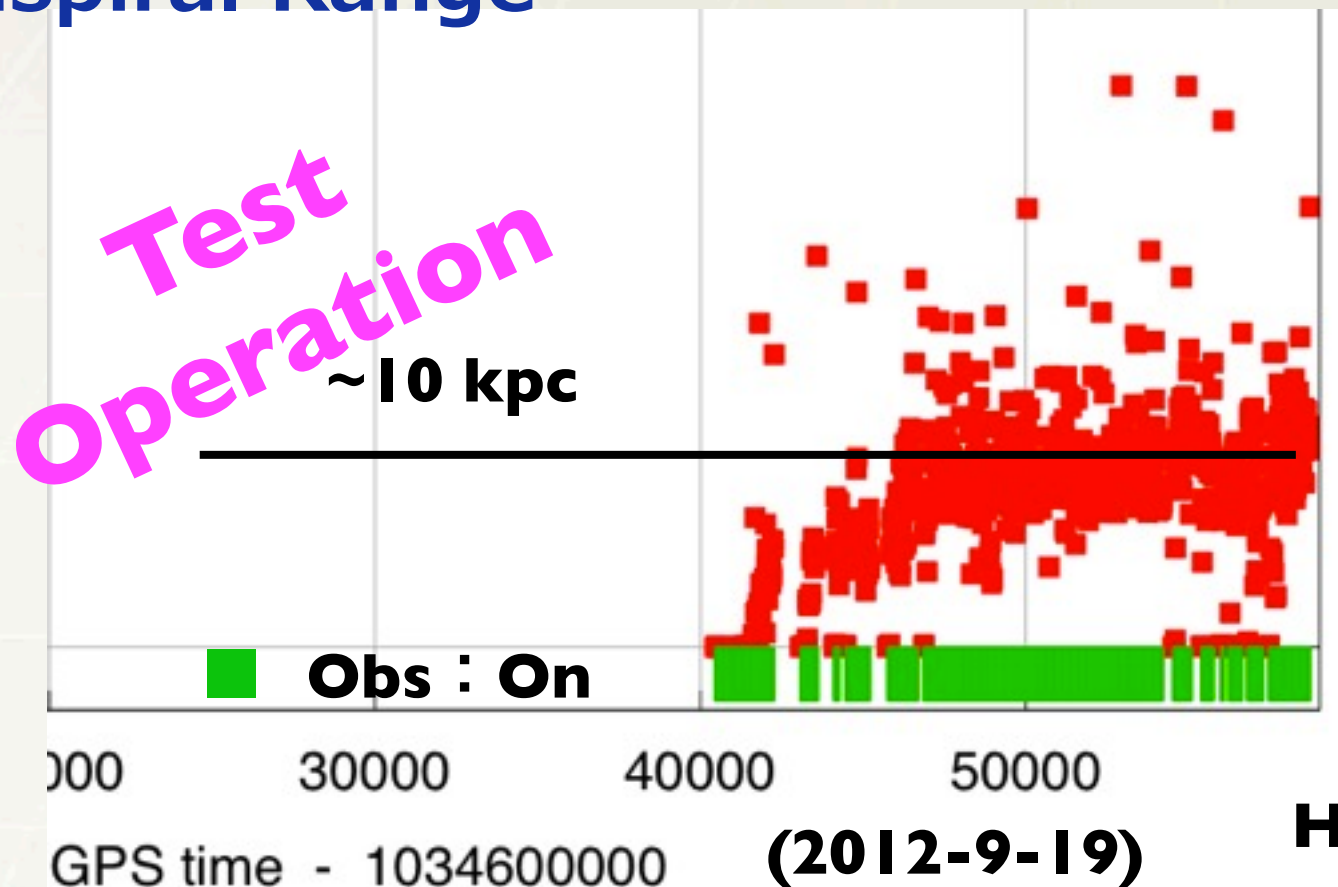
Convert to physical unit

Processing on time-series data

Generation of filters of TF

→ various kinds of analysis

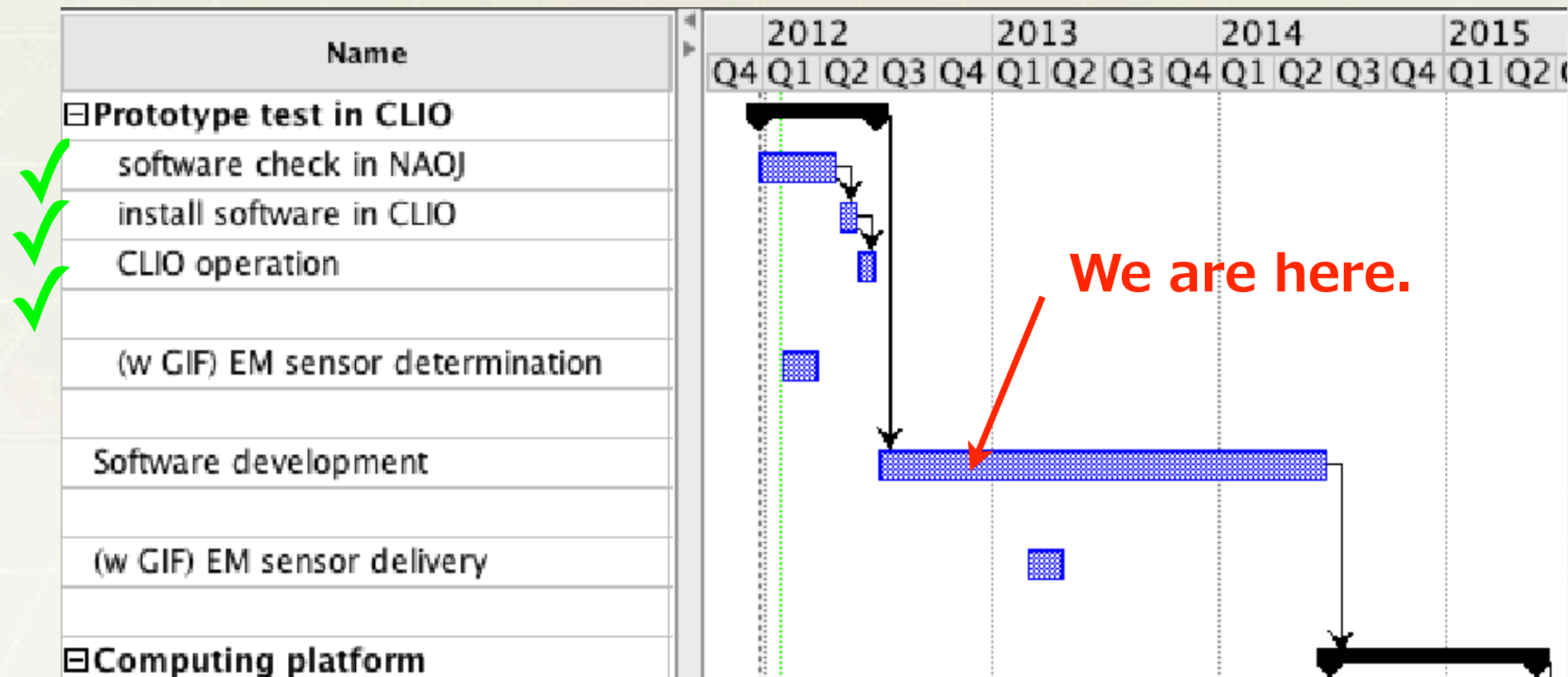
Inspiral Range

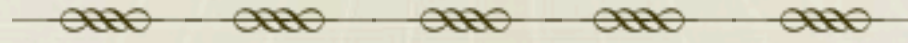


- Real time display of the inspiral range
- Total locked time ~13hrs

H.Yuzurihara

- System installed in NAOJ
- System installed in CLIO
- Test running during CLIO test operation.



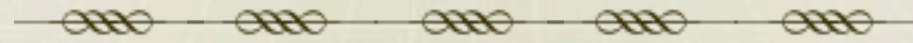


For commissioning

- subsystem diagnostics
 - Method for localization of noise sources
 - Evaluation of data quality
 - Sophistication of on-line monitor display
 - Calibration

For Observation

- Veto analysis
 - Method for distinguish triggered events are GW or not
- Data quality flag
- Distribution of data quality information to both internal and external collaborators

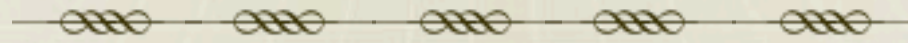


We discussed with K-detchar on our collab. projects and set our goal in last Dec. and this Feb.

Goal:

Development of a method for **localizing noise sources** using auxiliary channels and PEMs.
Support to kill noise sources

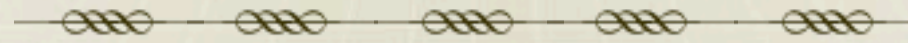
- So far several groups in LSC(including KGWG) have made their efforts on a **post-processing analysis (mainly Veto)** to distinguish whether triggered events are glitches or not.
- Our project focuses on **a tool useful for commissioning.**



- Event detection pipelines (K)
- Future selection statistics (t- or z- statistics) (K)
- To measure channels' responsibility for noise events(J)
- Classification of noise events (J)
- Integrating these information, localize the noise sources.

o First exam is to localize hardware injection we generated during last CLIO operation.

o Other exams are to do same for noise identified already in LSC



- There are several discussions
 - The Shadow monitor to reduces effects of violin modes.
 - Particularly, burst searches should be improved.
 - Evaluate what impact the monitor gives on data analysis?
 - Correlated environmental noise in global detector network.
 - Stochastic GWB search should be affected.
 - Calibration accuracy
- Great to have your suggestion what kind of monitors, evaluation, etc are useful for your subsystems.