

# DQ state vector of KAGRA

L-V-K Joint DetChar Meeting

Jun. 11, 2019

Takahiro Yamamoto

# KAGRA's software situation

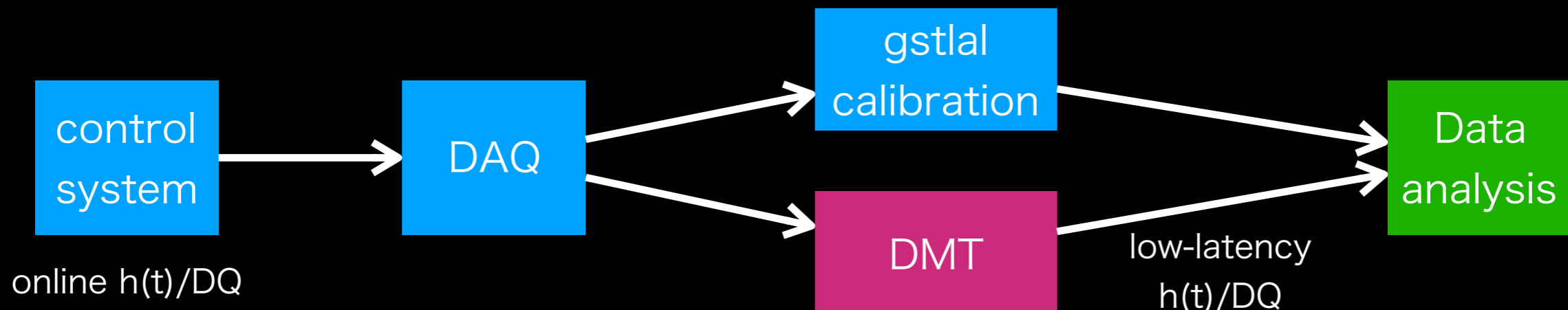
Interferometer control system and DAQ system are the copy of LIGO's system.

We don't have the DMT system.

Calibration group provides low-latency  $h(t)$  by using gstlal-calibration.

Online/low-latency DQ state vector should be contained in the same frame files with online/low-latency  $h(t)$ .

Only way to provide DQ state vector is using control system.  
(ODC like method, but it's very simple standalone model.)



# KAGRA's software situation

**We have already imported some DetChar tools from LIGO and Virgo.**

LIGO Summary Page

Bruco

Omega-scan (gwdetchar-omega)

Omicron

Fscan

h veto

# Online DQ flags (for ER on Jun. 6th)

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## Online Data Quality Vector

### Engineering Run with X-arm on the 8th June

- Channel name: **K1:DET-DQ\_STATE\_VECTOR**
- Sampling rate: 16 Hz
- Data type: Unsigned 32bit integer (FR\_VECT\_4U)

Bit	Description	0	1	Comment
0	Odd Parity	-	-	This is not a data quality information. It is used for checking validation of DQV.
1	Lock flag	Unlocked	Locked	This bit checks K1:GRD-LSC_LOCK_STATE_N (When GRD channel shows 31415, arm cavity is locked).
2	SDF flag	Not nominal	Nominal	This bit checks the setting of the IFO control is nominal or not (It may not work during IMC ER because someone will work on downstream of IMC).
3	Science mode	Not Science mode	Science mode	Science mode flag should be turned ON by manually after human check (It is automatically turned off when the lock is lost).
4	not used	-	-	(This bit will check OMC PD overflow for O3.)
5	MCE overflow	Overflow	No overflow	This bit checks MCE coil out overflow. (It will check ETMX for O3.)
6	not used	-	-	(This bit will check ETMY coil out overflow.)
7	NO Stoch injection	Injection	No injection	This bit checks the injection port of the k1calcs, k1calex, (and k1caley).
8	NO CBC injection	Injection	No injection	This bit checks the injection port of the k1calcs, k1calex, (and k1caley).
9	NO Burst injection	Injection	No injection	This bit checks the injection port of the k1calcs, k1calex, (and k1caley).
10	NO DET injection	Injection	No injection	This bit checks the injection port of the k1calcs, k1calex, (and k1caley).
11	NO CW injection	Injection	No injection	This bit checks the injection port of the k1calcs, k1calex, (and k1caley).
12	not assigned yet			
13	not assigned yet			
14	not assigned yet			
15	not assigned yet			

# Online DQ flags (for ER on Jun. 6th)

K1DET-DQ\_STATE\_VECTOR.adl

**DATA QUALITY STATE VECTOR**

**SCIENCE MODE**

ON OFF

0:	ODD PARITY
1:	LOCK STATE
2:	SDF STATE
3:	SCIENCE MODE
4:	not used for X-arm ER (OMC PD OVERFLOW)
5:	MCE COILOUT OVERFLOW (ETMX COILOUT OVERFLOW)
6:	not used for X-arm ER (ETMY COILOUT OVERFLOW)
7:	NO STOCH INJECTION
8:	NO CBC INJECTION
9:	NO BURST INJECTION
10:	NO DET INJECTION
11:	NO CW INJECTION
12:	not assigned yet
13:	not assigned yet
14:	not assigned yet
15:	not assigned yet

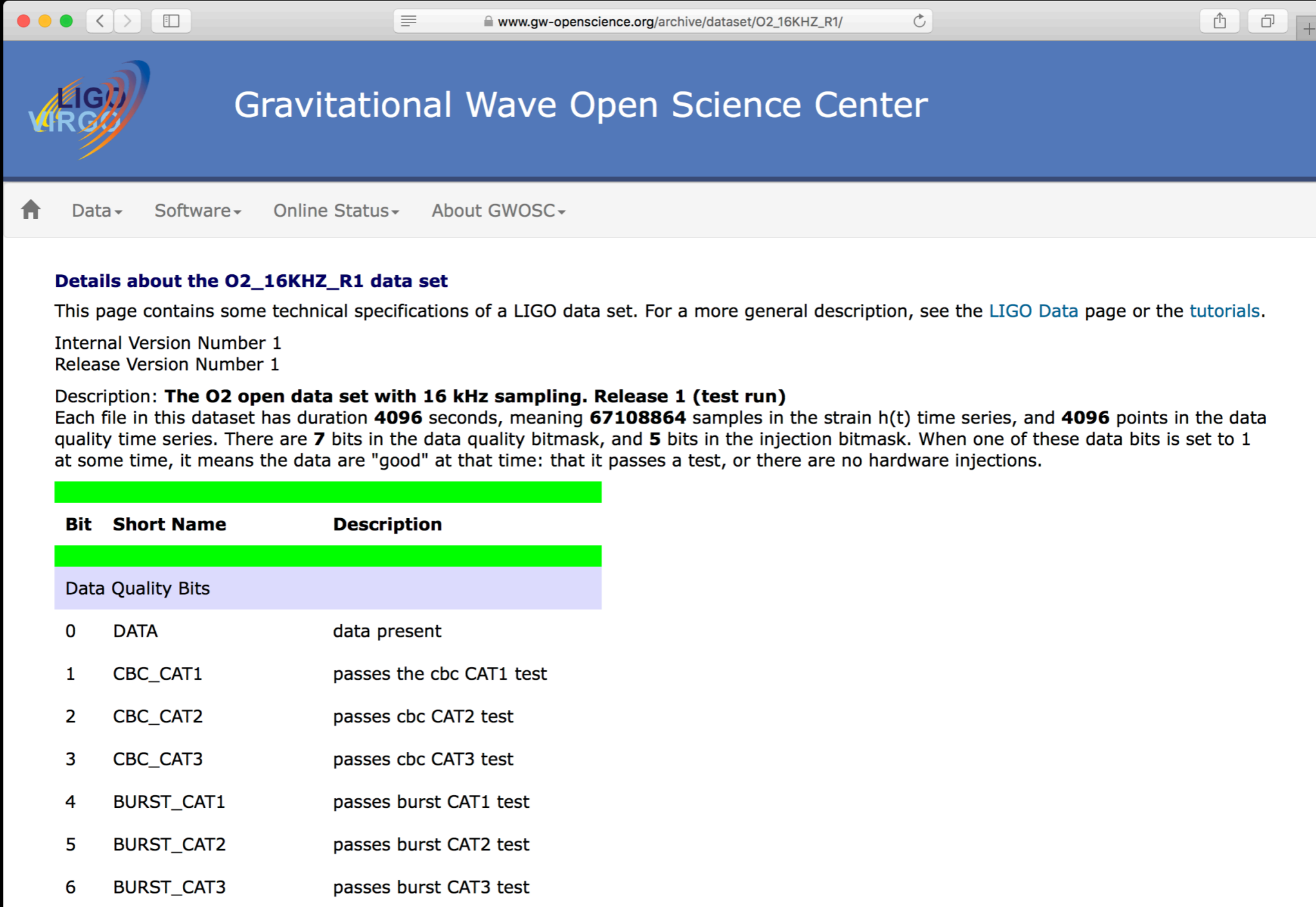
I start to discuss the  $h(t)$  reconstruction status.

# Offline DQ flags (for ER on Jun. 6th)

What are \$(IFO):DCH-\* ?

How should we do about Data Category flags?

How should we do about Data Quality Report?



The screenshot shows a web browser window with the URL [www.gw-openscience.org/archive/dataset/O2\\_16KHZ\\_R1/](http://www.gw-openscience.org/archive/dataset/O2_16KHZ_R1/). The page header features the LIGO VIRGO logo and the text "Gravitational Wave Open Science Center". A navigation bar includes links for "Data", "Software", "Online Status", and "About GWOSC".

**Details about the O2\_16KHZ\_R1 data set**

This page contains some technical specifications of a LIGO data set. For a more general description, see the [LIGO Data](#) page or the [tutorials](#).

Internal Version Number 1  
Release Version Number 1

Description: **The O2 open data set with 16 kHz sampling. Release 1 (test run)**  
Each file in this dataset has duration **4096** seconds, meaning **67108864** samples in the strain  $h(t)$  time series, and **4096** points in the data quality time series. There are **7** bits in the data quality bitmask, and **5** bits in the injection bitmask. When one of these data bits is set to 1 at some time, it means the data are "good" at that time: that it passes a test, or there are no hardware injections.

Bit	Short Name	Description
Data Quality Bits		
0	DATA	data present
1	CBC_CAT1	passes the cbc CAT1 test
2	CBC_CAT2	passes cbc CAT2 test
3	CBC_CAT3	passes cbc CAT3 test
4	BURST_CAT1	passes burst CAT1 test
5	BURST_CAT2	passes burst CAT2 test
6	BURST_CAT3	passes burst CAT3 test