LIGO-G020051-00-Z

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LIGO Reduced Data Sets

E7 standard reduced data set

RDS generation for future runs

decimation examples

Standard RDS – Guidance from LSC White Paper

Data set levels outlined in LSC white paper:

- Level 0: Full IFO data stream (not archived)
- Level 1: Archived reduced data set
  - all important IFO and PEM channels
  - used principally for detector diagnostics

~10% of Level 1

- Level 3: Whitened GW strain data
  - best estimate of GW strain

E7 Run – 400 Hours in Winter

(and lots and lots of data)

Full Frames (Level 1)	Reduced Frames ("Level 2")
11 Tbytes	3 Tbytes (w/o decimation)
LLO: 401 hours	LLO:
4.0 Tbytes	1.0 Tbyte
786 channels	75 channels
LHO: 410 hours	LHO:
7.2 Tbytes	2.0 Tbytes
4601 channels	106 channels

What's in the Reduced Frames for E7? *(located on LDAS disks)*

- all **LSC** error channels, plus DARM_CTRL
- some **ASC** channels
  - wavefront sensors for LHO
  - optical levers for LLO
  - transmitted light in arms
- a few **IOO** and **PSL** channels
  - frequency monitors
- many **PEM** channels
  - seismometers, accelerometers, microphones, magnetometers, voltage monitors
- several slow channels
  - weather, pre-stabilized laser, optical levers

Important

- need users from astrophysics groups to try E7 reduced frames
- need feedback about content of E7 RDS to help prepare future RDSs
- what important channels were not included?
- which channels were most used?

Just follow the links from the E7 web page!

(channel list, RDS directories, file names and sizes, time gaps)

Reduced Data Sets for Future Runs

- RDS will be generated using LDAS
- use frameAPI and datacondAPI to strip channels and to perform decimation
  - user testing of functionalities for RDS generation is currently ongoing
- RDS generation will be tested in a mock data challenge

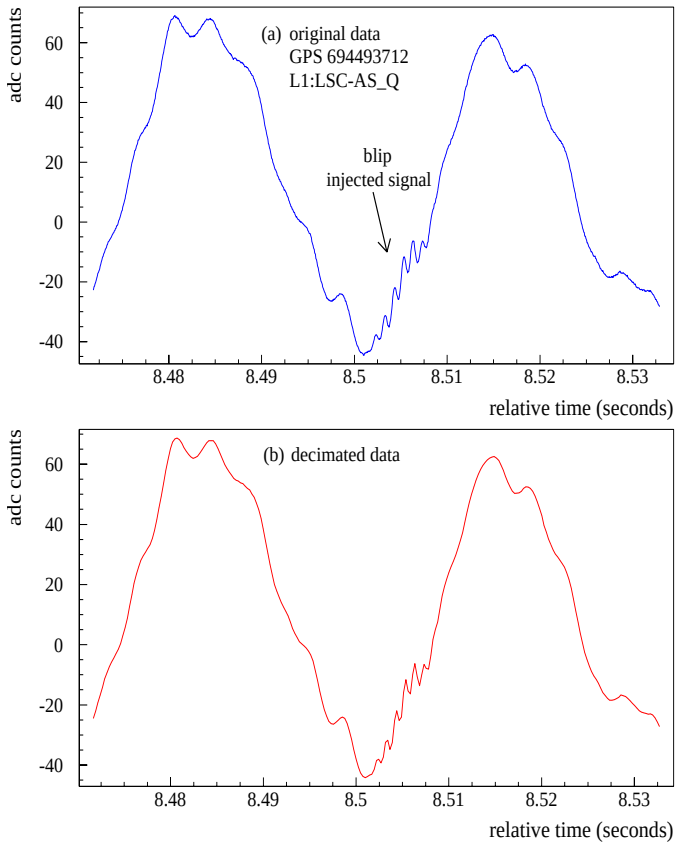
Important

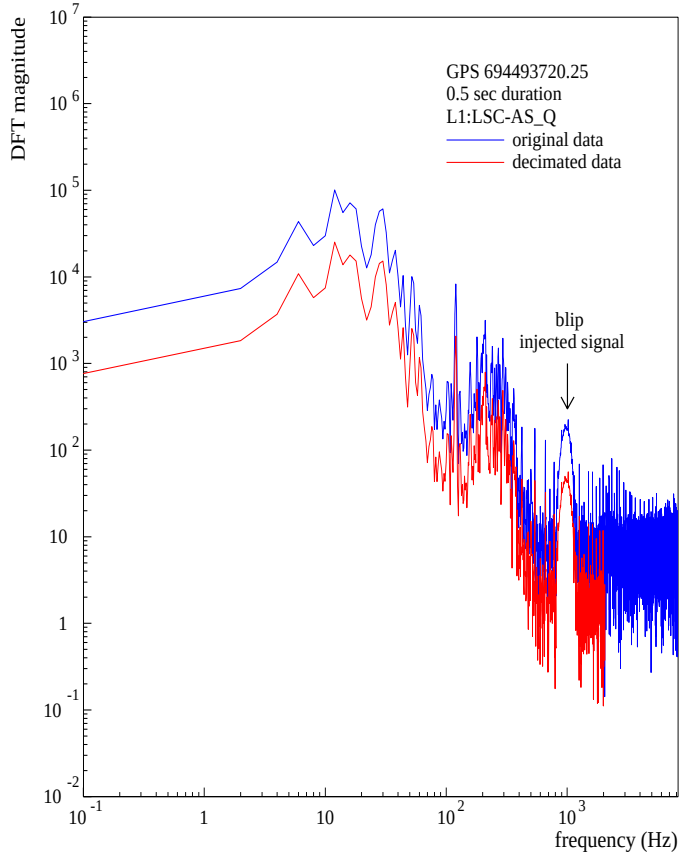
- what channels should be included in future Level 2 reduced data sets?
- should decimation be done on some channels?
  - need to study effects of data decimation
  - e.g. effects on output of astrophysics search codes, DMT trigger rates

Decimation Example

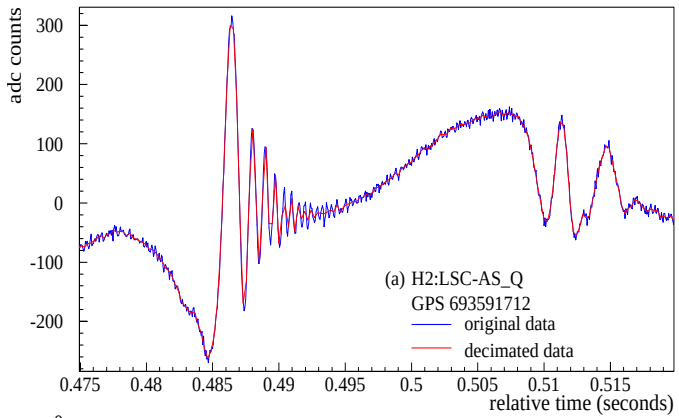
(using injected signal of P. Shawhan, et. al.)

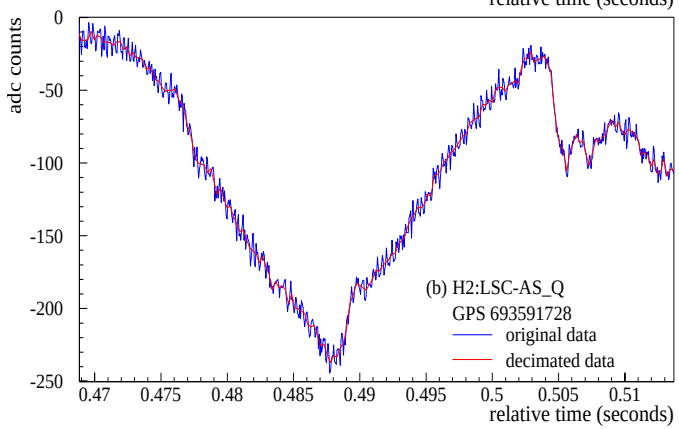
injected signal has 1 kHz frequency

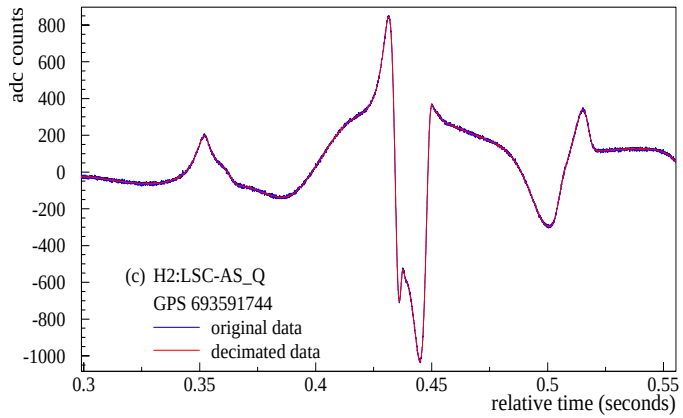


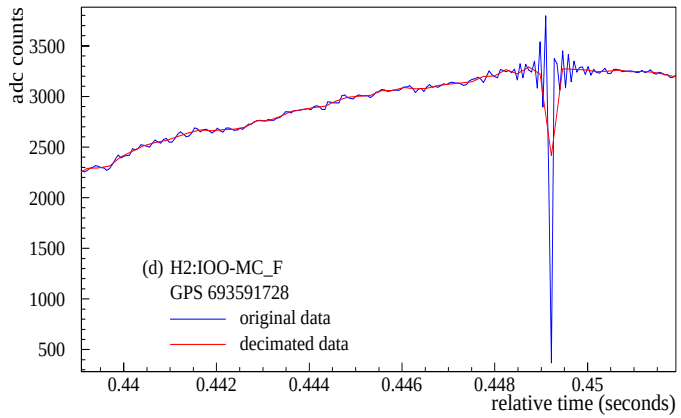


Decimation Examples – Time Series

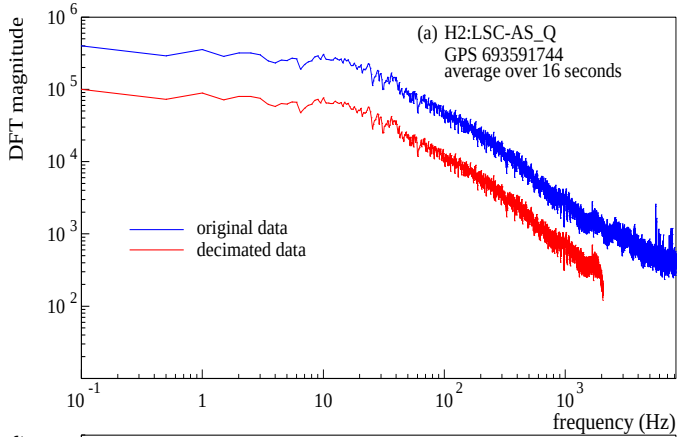


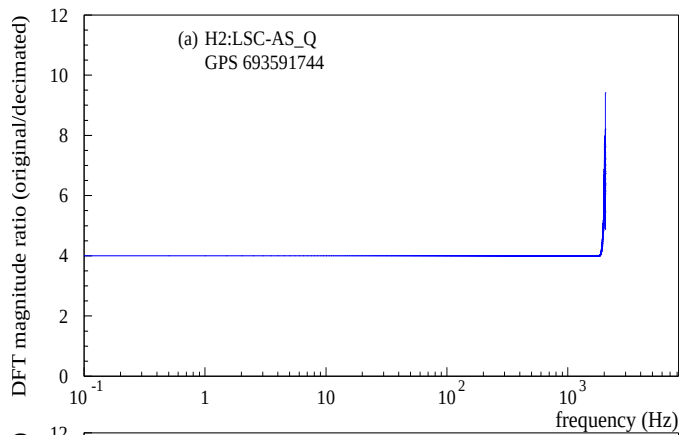


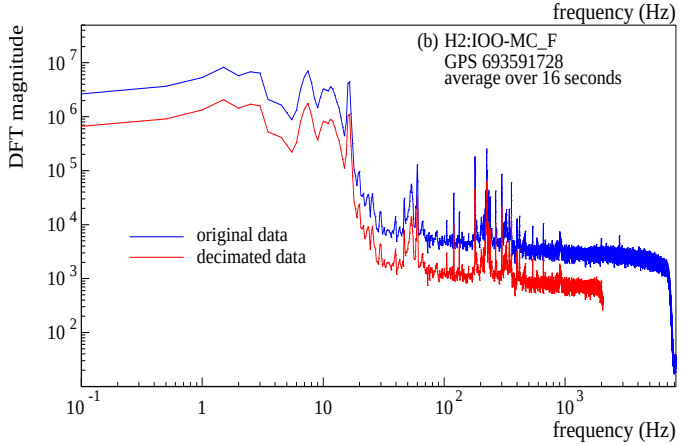


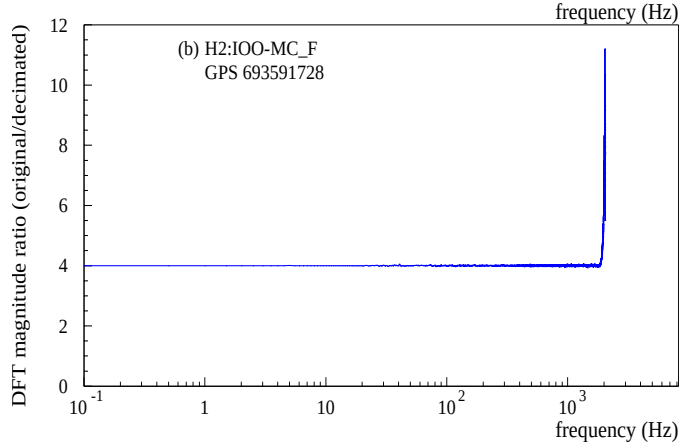


Decimation Examples – Fourier Transform









Summary

- E7 reduced data set now available – *try it!*
- need feedback from users of E7 RDS to help prepare for future RDSs
- LDAS to be used to generate future RDSs
- need to decide if decimation should be done on some channels for future RDSs