

Glitch study status

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LVK detchar meeting

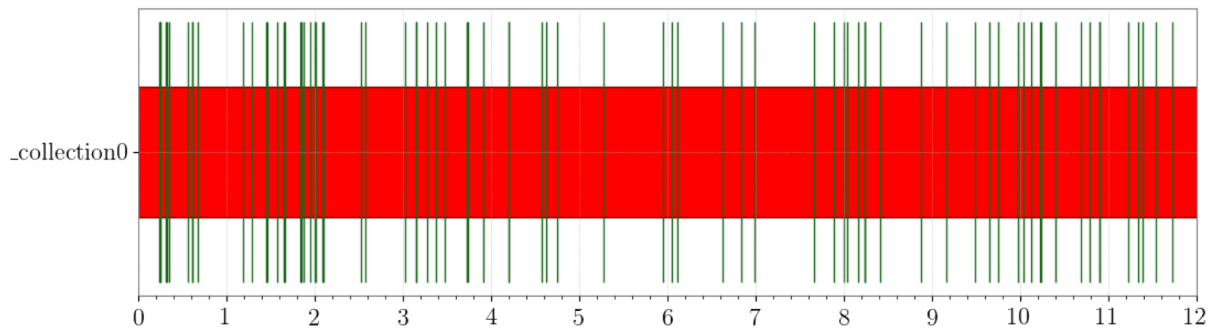
2019/6/11

Glitch plot

- I developed a tool to make glitch/lock loss relevant plots.
- The intent is to provide hints about what happened when glitches appear.
- For ER on 6/8, plots for following channels' trigger are produced.
 - LSC_CARM_SERVO_MIXER_DAQ_OUT_DQ
 - IMC_SERVO_SLOW_DAQ_OUT_DQ
 - AOS_TMSX_IR_PD_OUT_DQ
 - IMC_CAV_TRANS_OUT_DQ
 - PSL_PMC_TRANS_DC_OUT_DQ

Event counting method

- Omicron searches for large SNR time/band.
 - <https://tds.virgo-gw.eu/?content=3&r=11553>
 - <https://tds.virgo-gw.eu/?content=3&r=14693>
- Apply pre-cut by SNR and science mode flag for the omicron trigger event.
- Make a segment list by duration and start time of the trigger.



- 1 segment is counted as 1 event.
 - If 2 or more trigger times are overlapped or continuous, they are merged to 1 event.
 - Frequency difference is ignored.

Glitch plot method

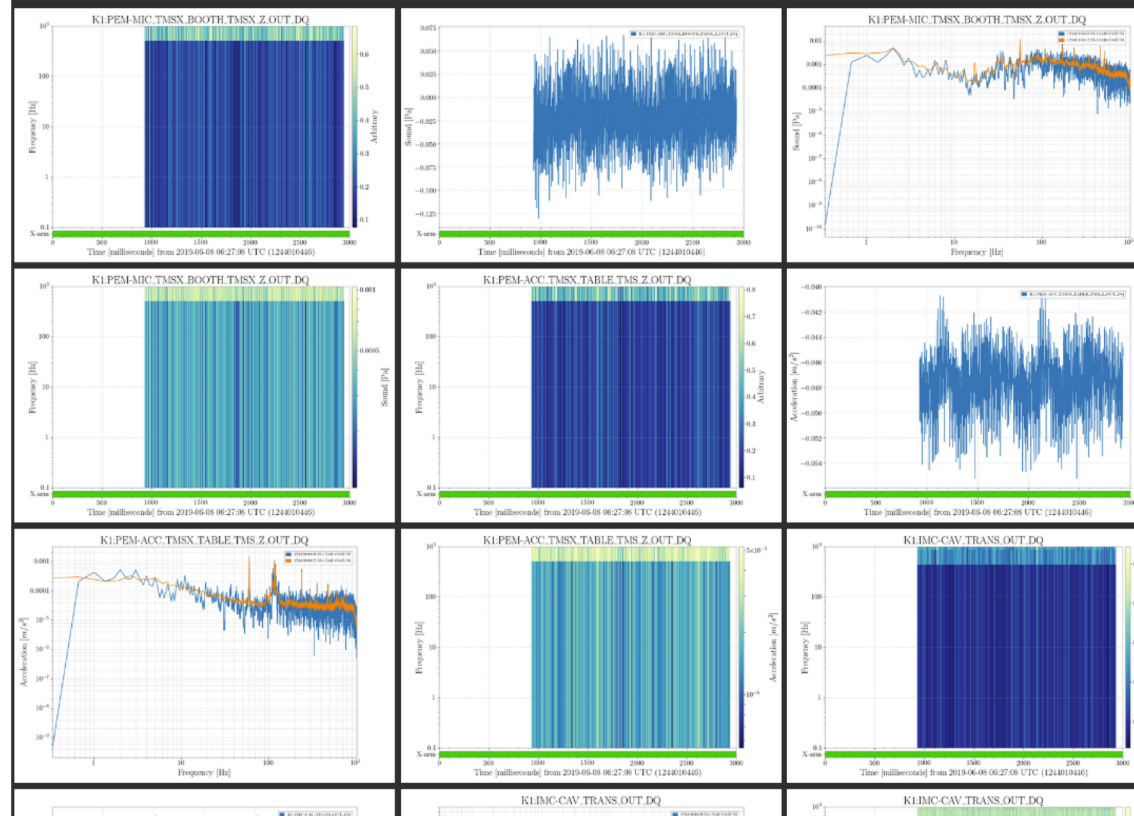
1. Applying SNR cut, get trigger segments from Omicron trigger.
 - $\text{SNR} > 100$ is applied in ER.
2. For each event, choosing some relevant channels, basic plots are made. The parameter for plots are determined based on trigger information.
 - Time series, spectrum, spectrogram, whitened spectrum, coherencegram
 - Plots are in
`/users/DET/Result/GlitchPlot/plotter_$channel$triggerTime/`
3. It runs every 15 minutes in k1sum1.
 - The result appears ~1 hour after event.
4. The results are also uploaded on Yuzu summary page daily.
 - https://www.icrr.u-tokyo.ac.jp/~yuzu/bKAGRA_summary/html/2019-06-08_GlitchPlot.html

Example result

- The result contains plots of
 - Trigger channel
 - Upstream channels
 - Unsafe channels
 - PEM channels near the detector

Summary page of KAGRA commissioning

If you have any problem, any comment and any request about this page, please contact yuzurihara (yuzu@icrr.u-tokyo.ac.jp).



Update plan

- Classify events into glitch and lock loss category
- Change SNR threshold channel by channel
- Improve parametrization for plotting
- Improve relevant channel list
- Improve web page visualization
- Add trigger information in web page.
- Provide trigger rate using lock state daily.
- Change the directory structure

- **Your comments and requests are welcome !**
 - Interesting channel, bug report, ...

