

*Dataset archiving
for glitch morphology with coherence information*

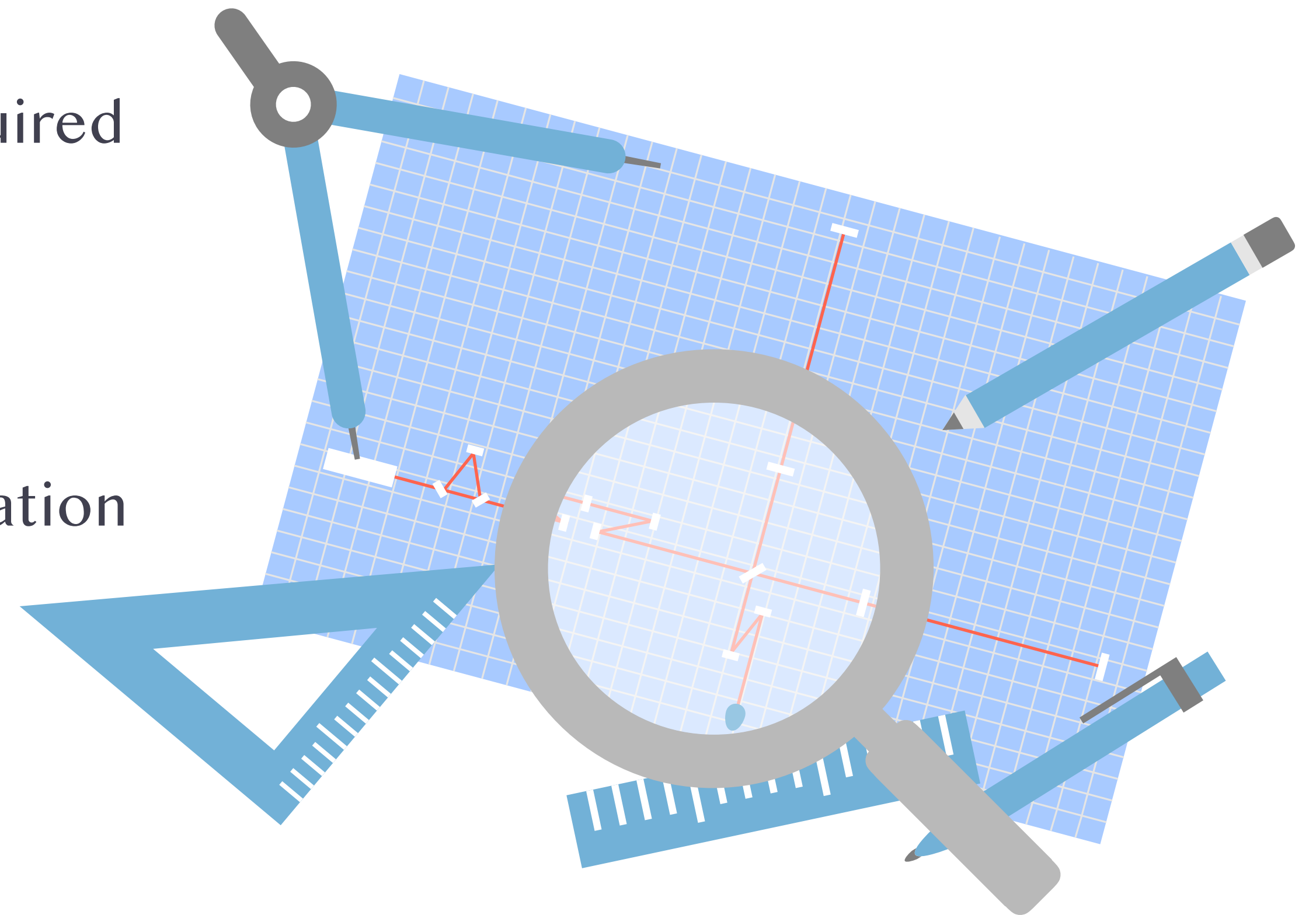
PIL-JONG JUNG, LVK DETCHAR MEETING, **11 JUNE 2019**

NEEDS

- KAGRA does not have much basic glitch information such as Glitch type, Glitch cause and so on
- Effective glitch information collection required

IDEA

- Collecting OmegaSacr dataset with correlation information from the h-veto method



DATASET ACHIVING WITH H-VETO

Channels list

Ch0 : main channel

Ch1 : unsafety ch. of main ch.

Ch2 : aux channel

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Ch00 : aux channel

h-veto
○----->

Round winner Channels

R1 : unsafety ch. of main ch.

R2 : some aux channel

.

.

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R00 : some aux channel

DATASET ARCHIVING WITH H-VETO

Get vetoed trigger info about each Round winner Channel

R1 : unsafety channel of main channel

time peak_frequency snr channel

1235738318.291992 746.904296875 6.830560207366943 K1:PSL-PMC_FAST_MON_OUT_DQ

1235738318.292968 751.12451171875 7.438230037689209 K1:PSL-PMC_FAST_MON_OUT_DQ

...

R2 : some aux channel

time peak_frequency snr channel

1235738317.001953 70.39215087890625 8.42986011505127 K1:IMC-CAV_TRANS_OUT_DQ

1235738317.001953 111.263427734375 9.74491024017334 K1:IMC-CAV_TRANS_OUT_DQ

...

DATASET ARCHIVING WITH H-VETO

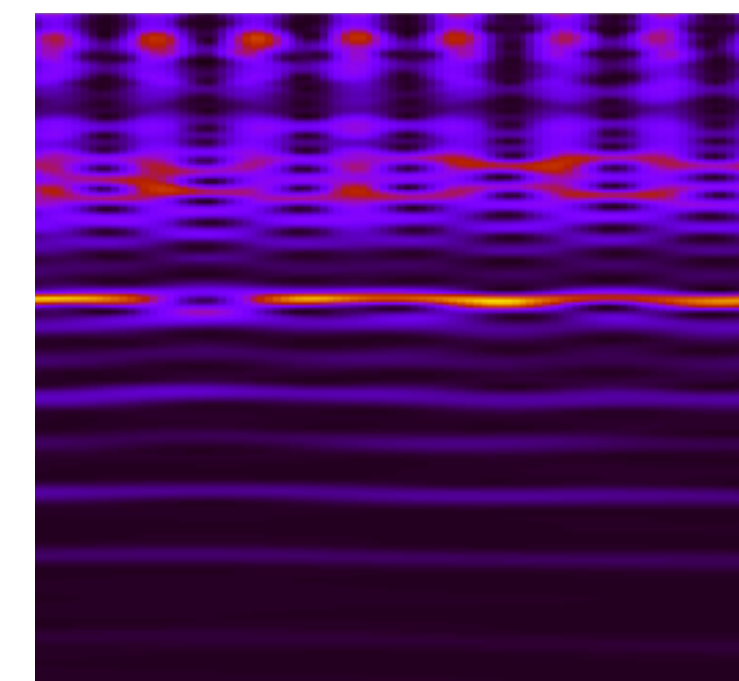
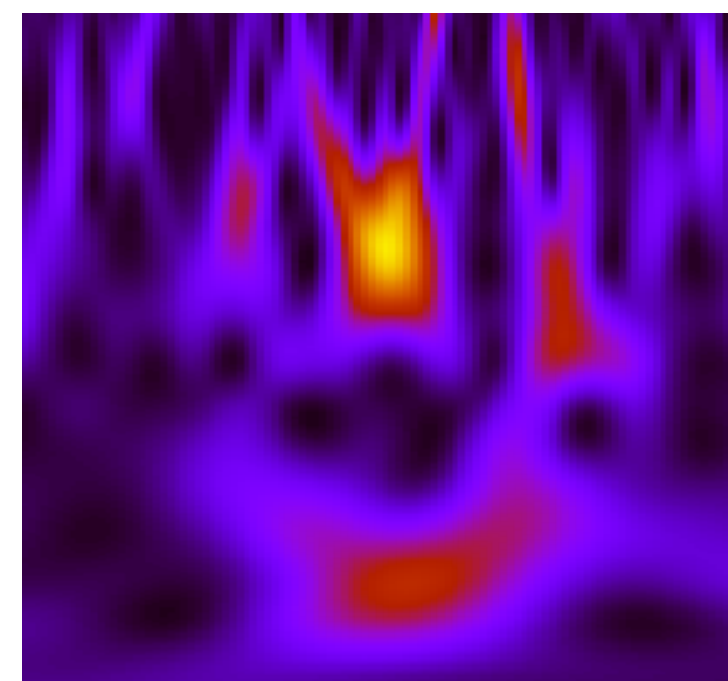
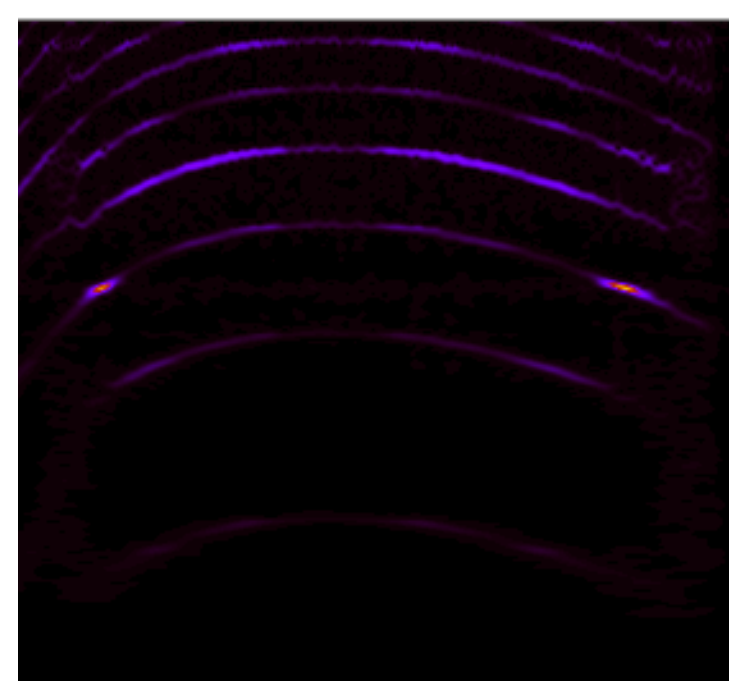
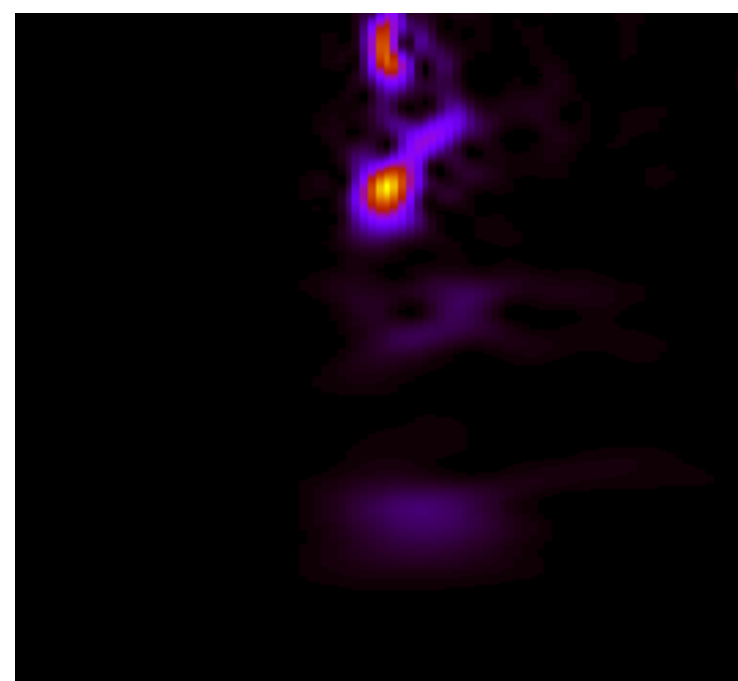
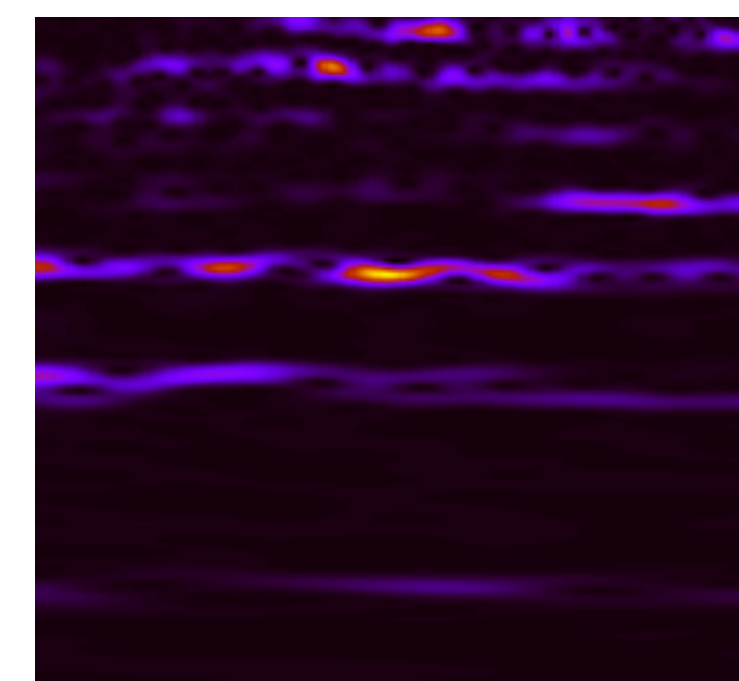
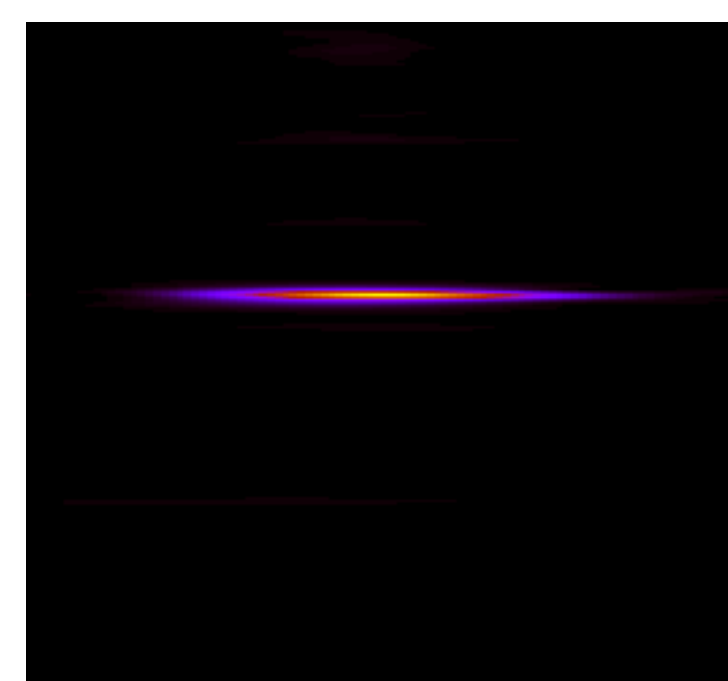
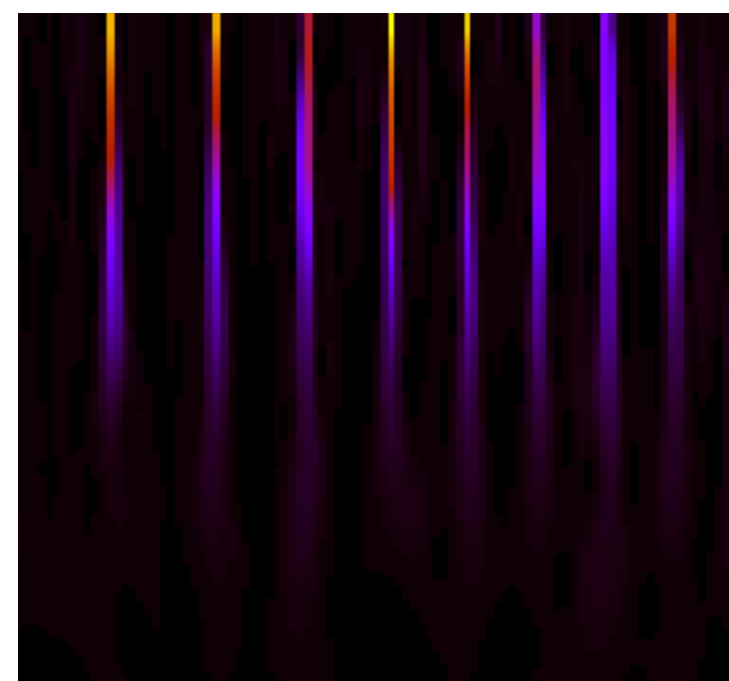
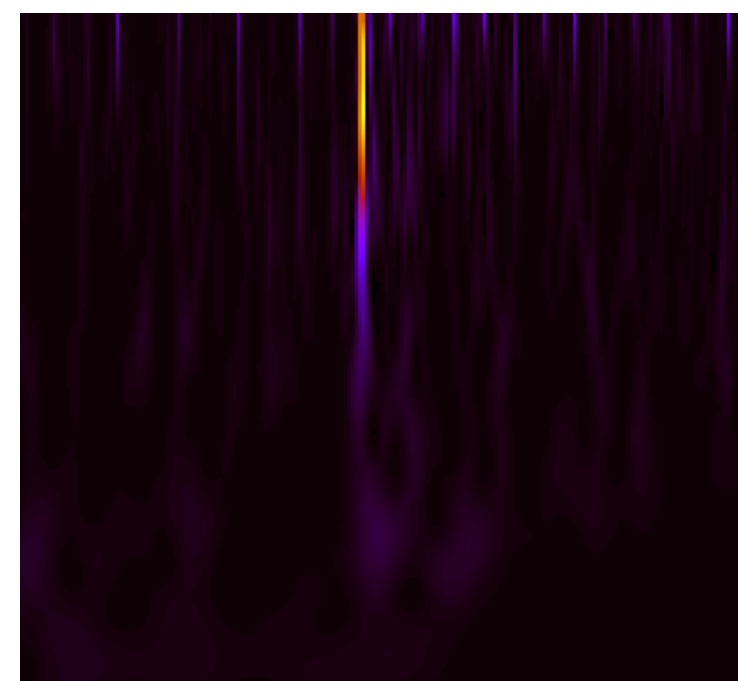
Obtain glitch trigger info table

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<Table length=1741>
round      primary_channel      aux_channel      peak_time      peak_freq      snr
str2       str27                str26            float64        float64        float64
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R1 K1:PSL-PMC_MIXER_MON_OUT_DQ K1:PSL-PMC_FAST_MON_OUT_DQ 1235778802.443847 97.18505096435547 479.7186279296875
R1 K1:PSL-PMC_MIXER_MON_OUT_DQ K1:PSL-PMC_FAST_MON_OUT_DQ 1235778802.515625 23.662500381469727 114.83805084228516
R1 K1:PSL-PMC_MIXER_MON_OUT_DQ K1:PSL-PMC_FAST_MON_OUT_DQ 1235778802.442138 11.778840065002441 113.29849243164062
R1 K1:PSL-PMC_MIXER_MON_OUT_DQ K1:PSL-PMC_FAST_MON_OUT_DQ 1235778802.438232 584.3345336914062 113.1568832397461
R1 K1:PSL-PMC_MIXER_MON_OUT_DQ K1:PSL-PMC_FAST_MON_OUT_DQ 1235778802.435547 584.3345336914062 112.51071166992188
R1 K1:PSL-PMC_MIXER_MON_OUT_DQ K1:PSL-PMC_FAST_MON_OUT_DQ 1235778802.457519 856.0394897460938 109.77850341796875
R1 K1:PSL-PMC_MIXER_MON_OUT_DQ K1:PSL-PMC_FAST_MON_OUT_DQ 1235778802.421875 11.778840065002441 109.09343719482422
...
R2 K1:PSL-PMC_MIXER_MON_OUT_DQ K1:PSL-PMC_TRANS_DC_OUT_DQ 1235778803.03125 929.2885131835938 11.716090202331543
R2 K1:PSL-PMC_MIXER_MON_OUT_DQ K1:PSL-PMC_TRANS_DC_OUT_DQ 1235778801.875 929.2885131835938 10.938090324401855
R2 K1:PSL-PMC_MIXER_MON_OUT_DQ K1:PSL-PMC_TRANS_DC_OUT_DQ 1235778801.90625 972.2463989257812 10.931730270385742
R4 K1:PSL-PMC_MIXER_MON_OUT_DQ K1:PSL-PMC_TRANS_DC_OUT_DQ 1235778801.6875 584.3345336914062 13.964690208435059
R4 K1:PSL-PMC_MIXER_MON_OUT_DQ K1:PSL-PMC_TRANS_DC_OUT_DQ 1235778803.3125 584.3345336914062 12.295809745788574
R4 K1:PSL-PMC_MIXER_MON_OUT_DQ K1:PSL-PMC_TRANS_DC_OUT_DQ 1235778803.15625 584.3345336914062 11.571940422058105
R4 K1:PSL-PMC_MIXER_MON_OUT_DQ K1:PSL-PMC_TRANS_DC_OUT_DQ 1235778801.5625 584.3345336914062 10.33827018737793
R4 K1:PSL-PMC_MIXER_MON_OUT_DQ K1:PSL-PMC_TRANS_DC_OUT_DQ 1235778848.453125 929.2885131835938 10.152999877929688

In [678]: t.meta
Out[678]: OrderedDict([('snr_threshold', 10), ('timewindow', 0.1)])
```

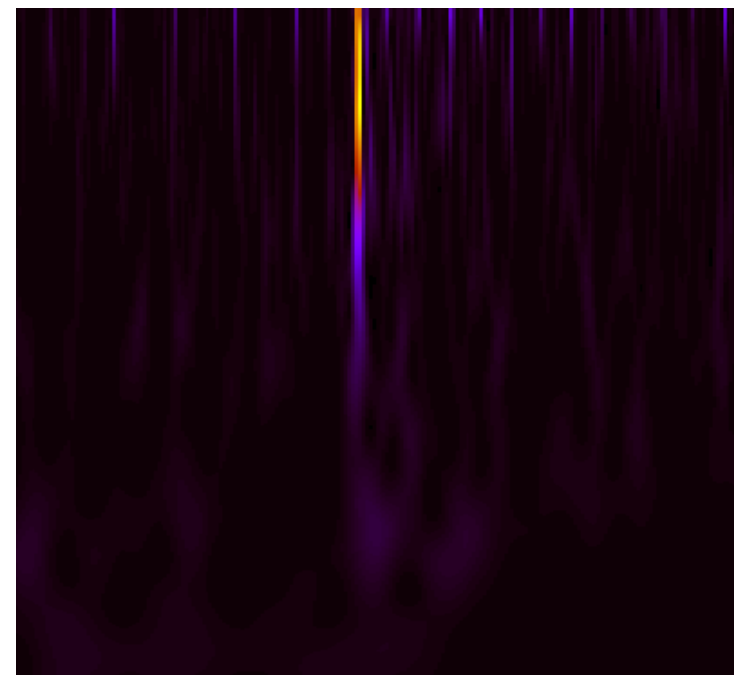
DATASET ARCHIVING WITH H-VETO

Obtain OmegaSacn plots from glitch trigger info table



DATASET ARCHIVING WITH H-VETO

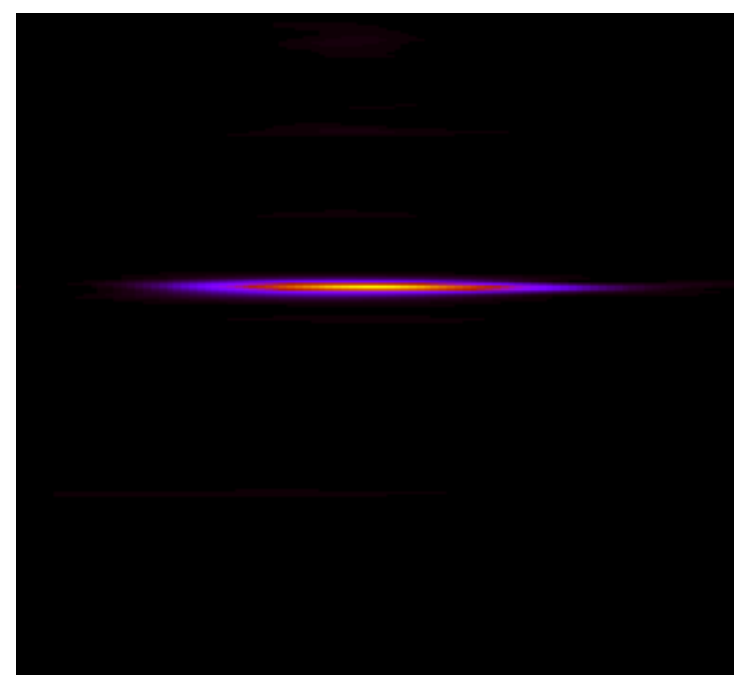
Glitch Dataset with coherence info



Channel : K1:PSL-PMC_FAST_MON_OUT_DQ

Class : blip

Correlated to : K1:PSL-PMC_MIXER_MON_OUT_DQ



Channel : K1:IMC-CAV_TRANS_OUT_DQ

Class : plate

Correlated to : K1:PSL-PMC_MIXER_MON_OUT_DQ

FUTURE PLAN

- More collecting data and need labeling
- Find the cause of each glitch
- Glitch classification using machine learning with labeled data
- Need to develop learning model including cause and correlation information of glitch

