

Summary report of burst search activities with cWB

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on behalf of the KAGRA burst group

Outline

- Development of burst search pipeline (cWB)
 - summary for three engineering runs
 - solo observation run

- Current status
 - O3GK

Development of Burst Search Pipeline

- Method
 - Using coherent WaveBurst (cWB) Klimenko et al 2016; Essick et al 2015
- Novel extension:
 - Algorithm: Stokes Circular Polarisation(SCP)
 - particularly important in the four-detector era

Pipeline: current status

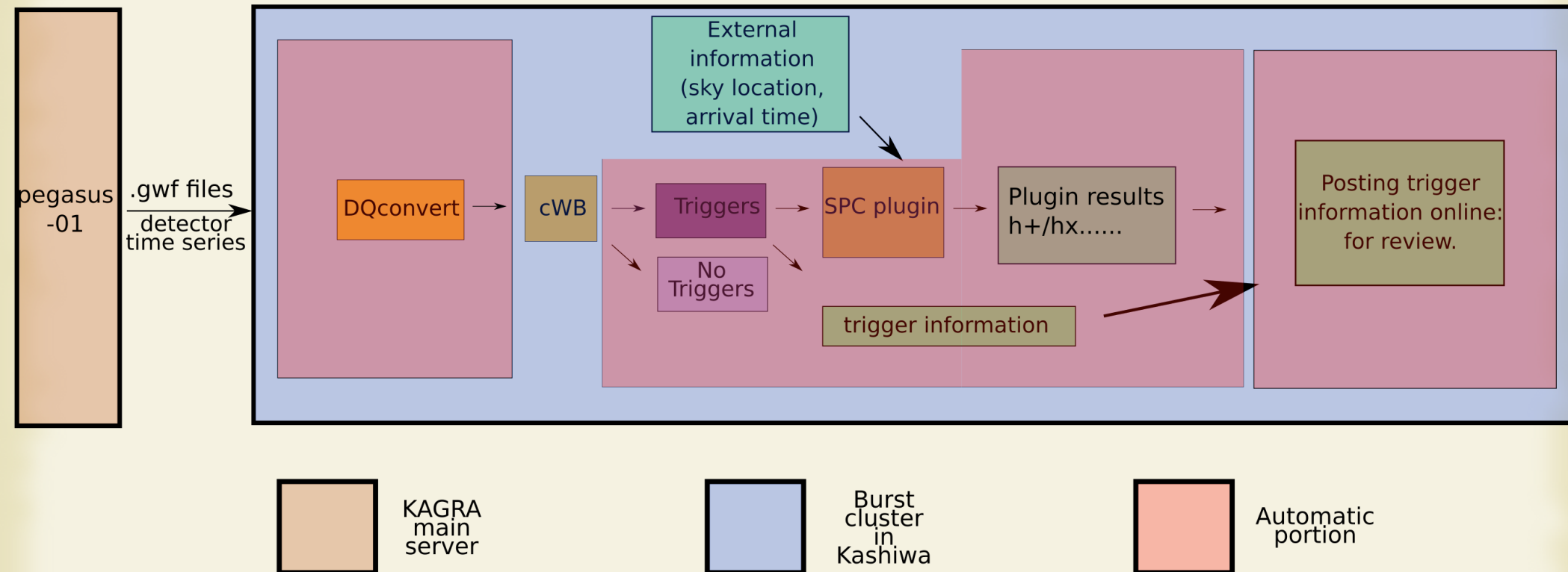


Figure 1. A flow chart showing the analysis steps of the cWB pipeline with the SPC plugin. External information refers to information from neutrino and/or electromagnetic observations.

Engineering runs

- ER2, Jul 2019 6 hours
 - testing whether the pipeline could
 - run without problem
 - be applied to KAGRA data
- ER3, Dec 17th – 24th 2019
 - futher test of the pipeline
 - Updated burst result page
 - to include more information of each run
 - referenced LV cWB page heavily
- ER4, Feb 20th to 25th 2020
 - not much data coincidental with other detectors

Observation runs

- Solo observation, Feb 25th to Mar 7th 2020
 - further tests of the pipeline
 - to analyse as much KAGRA data as possible
 - four runs in parallel
 - KLHV; KLH; KLV; KHV
- O3GK
 - started preliminary test of the SCP algorithm
 - GEO data/cWB not optimally compatible
 - filter applied and verifying the results
- All these search activities
 - in collaboration with DetChar group

Summary

- Analysed using cWB the data taken during
 - three engineering runs and solo observation run
 - to test the pipeline
 - corresponding burst page updated
- Developed the SCP algorithm
 - to work with cWB
 - for computing the Stokes parameters
 - important for four detector era
- For O3GK
 - still analysing data and verifying results
- These activities were carried out in collaboration with DetChar group

Thank you

Reference

- S. Klimenko, G. Vedovato, M. Drago, et al. Method for detection and reconstruction of gravitational wave transients with networks of advanced detectors. *Physical Review D*, 93(4):042004, February 2016
- R. Essick, S. Vitale, E. Katsavounidis, G. Vedovato, and S. Klimenko. Localization of Short Duration Gravitational-wave Transients with the Early Advanced LIGO and Virgo Detectors. *The Astrophysical Journal*, 800:81, February 2015