



Contribution ID: 448

Type: **Talk in a parallel session**

## PyGRB: A matched filtering triggered gravitational-wave search pipeline

*Thursday, 11 July 2024 17:40 (20 minutes)*

(pdf version attached)

Ever since the observation of GW170817 provided evidence for binary neutron star mergers as sources of gravitational waves and other transient emissions such as short gamma-ray bursts, the development of electromagnetically informed gravitational-wave analysis pipelines has gained relevance in the astrophysics community [2, 1, 3, 4]. In this talk, I will illustrate the most recent implementation of PyGRB, a coherent gravitational-wave search that uses matched filtering and targets the time and sky locations of electromagnetic transients, typically short gamma-ray bursts. The coherent matched filtering implementation for a multidetector network will be shown in detail, highlighting differences with respect to typical all-sky coincident searches. Finally, performance measurements and test runs will be shown as proof of concept for its usage.

### References

- [1] I. W. Harry and S. Fairhurst. A coherent triggered search for single spin compact binary coalescences in gravitational wave data. *Class. Quant. Grav.*, 28:134008, 2011.
- [2] Ian W. Harry and Stephen Fairhurst. A targeted coherent search for gravitational waves from compact binary coalescences. *Phys. Rev. D*, 83:084002, 2011.
- [3] A. R. Williamson, C. Biwer, S. Fairhurst, I. W. Harry, E. Macdonald, D. Macleod, and V. Predoi. Improved methods for detecting gravitational waves associated with short gamma-ray bursts. *Phys. Rev. D*, 90(12):122004, 2014.
- [4] Andrew Robert Williamson. Gravitational waves with gamma-ray bursts. PhD thesis, Cardiff U., Cardiff University, 2016.

**Primary author:** GÓMEZ LOPEZ, Sebastian (La Sapienza Università di Roma)

**Presenter:** GÓMEZ LOPEZ, Sebastian (La Sapienza Università di Roma)

**Session Classification:** Multi-messenger astronomy with gravitational waves

**Track Classification:** Multimessenger Astrophysics (MA): Multi-messenger astronomy with gravitational waves