

Update from the LIGO-Virgo EM follow-up group

2018-01-24 Marica Branchesi, Erik Katsavounidis, Leo Singer for the LIGO and Virgo Collaborations

- The LVC will issue Open Public Alerts (OPAs, without any MOUs) starting with O3 and beyond, and are committed to working out technical aspects of the OPAs with the EM community.
- Extensive discussion within the LVC working groups has commenced on the details of the implementation of such OPAs, both on policy and on specifications and requirements that collectively the broader GW-EM community will set for such program.

More specifically:

- + what is the balance between prompt alerting on the existence of a detection candidate and the fact that such promptness will intrinsically come with some less than perfect (100%) ability to solidly identify detection candidates that will pass the offline analysis criteria?
- + what are such numbers that will make sense from the scientific point of view?
- + what are such numbers that will make LVC and the open astronomy community comfortable to operate under?
- + what is the OPA event content? Some information will be promptly available, alas with significant errors and very likely to change over the course of hours, days and months with the ultimate result becoming available (most likely) when offline analyses complete.

- What are the science drivers/payoff and the corresponding implementation details for making available any events that go beyond the "Detection Candidate" level?

- + GW transient events with a false alarm rate at, say, 1/month will be unlikely (but not impossible) to meet the requirements (at least of the LVC's) to be announced as GW detections; what is the science payoff in pursuing such alerts in the EM/neutrinos: more BBHs/BNSs detections? serendipity for the new and unexpected?

- + Is it sensible to make such events available through the open public alerting system, through MOU-only partnership, or not make them available at all?

- + If available, will such events be better pursued in a collaborative way involving the LVC and the astronomer partners?

- What are the science topics and corresponding measurements that will maximize the science outcome by combining the GW and EM measurements (e.g., by having access to the full error budgets for all measurements)?
 - + is there need for MOU-based, specific science-driven joint analyses/interpretation?
- Extensive work within the LVC is currently under way on technical aspects of the infrastructure that will make such OPAs available
 - + the list is huge and will require a dedicated telecon to do justice to it!
 - + expect to produce full documentation and invite EM partners to comment and review such technical implementation
 - + always available to present