

LVK Coordination of Observing Runs

OpenMMA Call

22 May 2025

LVK Liaison to OpenMMA



- Deep Chatterjee (deep.chatterjee@ligo.org) has been appointed the LVK liaison to the OpenMMA community.
- Deep will work with the OpenMMA community
 - to ensure that the LVK-side presentations answer the needs of the OpenMMA community,
 - and will bring forward topics that the LVK would like to discuss in this forum.

LVK Coordination of Observing Runs



- Dates and durations of LVK observing runs are primarily driven by instrument readiness
 - The currently planned gap between the ongoing O4 run and the next O5 run is set by our best estimate of the time it will take to install and commission the detector upgrades that will make significant sensitivity improvements.
 - As a result, when O4 was extended, the anticipated start date of O5 also shifted.
 - We endeavor to only shift observing run dates when operationally necessary
 - E.g., we need to address an acute equipment failure, or a technology isn't ready and it makes more sense to 'wait' while observing
- We take into account operational schedules of MMA observatories
 - This has proven to be difficult to align "perfectly"
 - It would be useful to have a common space where we all share up-to-date information on mission, experiment, and observatory schedules, eg ACROSS
- The assessment of sensitivity improvements encapsulates detection possibility of compact binary and other gravitational-wave sources

Plans and Timelines for Upcoming Catalogs

- LVK Catalog Release Timeline is set by the Data Release Timeline
 - Data Release Timeline available in <https://dcc.ligo.org/LIGO-M1000066/public>

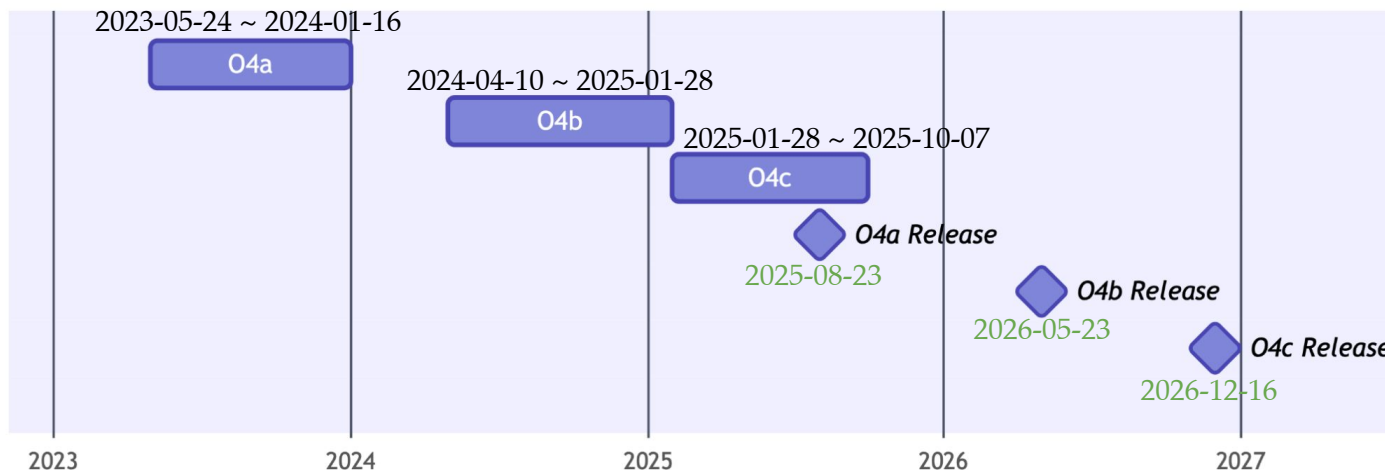


Figure 3: *Planned timeline for O4 observing run (rectangles) and data releases (diamonds). Strain data releases are publicly released following a proprietary period after each run.*

Plans and Timelines for Upcoming Catalogs

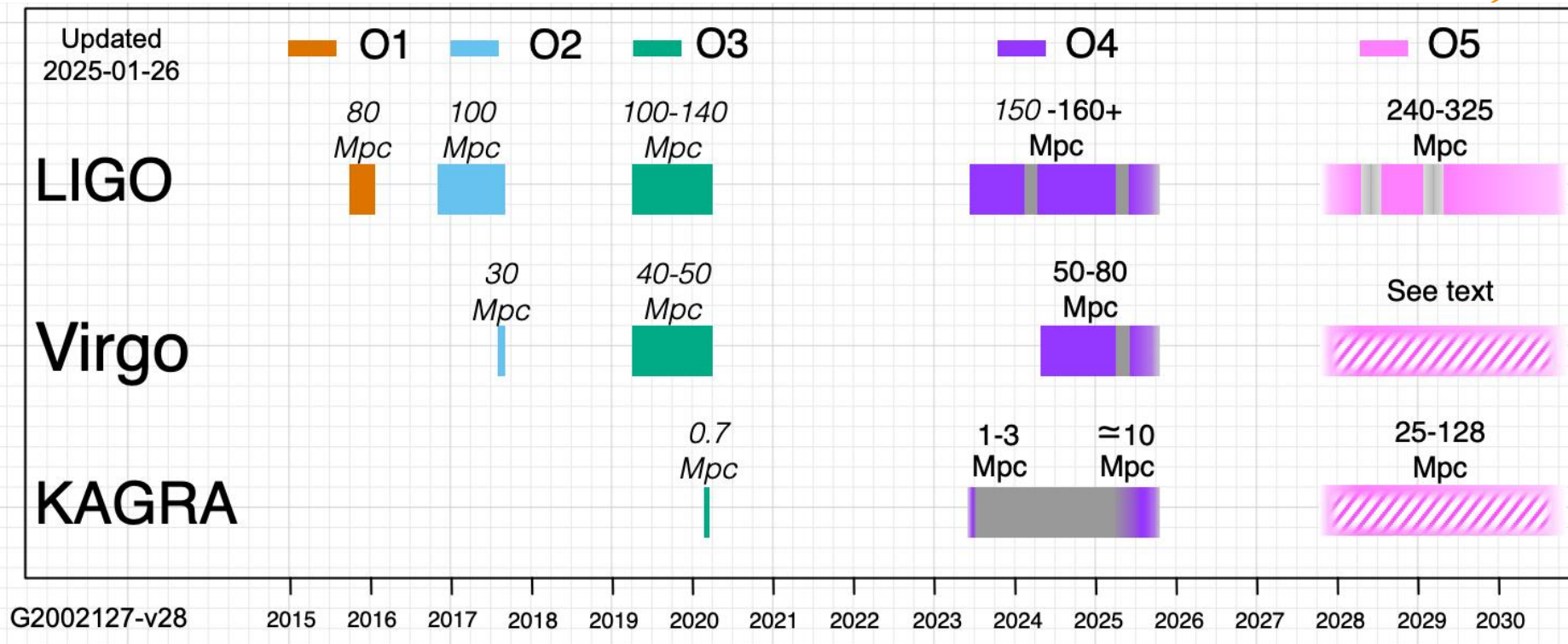


Release type	Section	Notes	Timing
Low-latency alert	3.2	Enables astronomical follow-up of GW transients. Includes sky position, but no strain data.	Starting minutes after each detection
Published events	3.4.3	Strain data at times of GW transients	Released at time of publication in a scientific journal
Analysis products	3.5	Includes parameter estimation samples and other details of observed GW transients	Typically released at time of publication in a scientific journal
Full strain data	3.4.4	Strain data for an observing period	Released after a proprietary period

Table 1: *Summary of different types of data releases and their associated timing.*

<https://dcc.ligo.org/LIGO-M1000066/public>

LVK Observing Plan



<https://observing.docs.ligo.org/plan>

[updated at least monthly on the 15th of the month]

Coarse Grained Mass Information



Coming soon to low latency public alerts

LVK will provide binned estimates of the chirp mass \mathcal{M} for CBC events, including cWB BBH events. In solar masses, the chirp mass bins are:

$$[0.1, 0.87, 1.0, 1.1, 1.2, 1.3, 1.4, 1.5, 1.7, 1.9, 2.1, 2.3, 3, 5.5, 11, 22, 44, 88, 1000] \quad (1)$$

These estimates will be in the source frame, *except* in the case of the low-latency cWB BBH estimate, where there is no distance or redshift information available. In this case, we will report the “detector frame” estimate.

The \mathcal{M} information will be distributed by reporting the highest probability, or most likely, bin in the circular, and by making a `.json` file of the probabilities for each bin public on **GraceDB**. The information will *not initially* be included in the alert packet `.xml`. This should ease integration for O4; inclusion is a possible goal for O5.