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Follow-up of gravitational waves alerts with IACTs using Astro-COLIBRI

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Follow-up of gravitational wave alerts has proven to be challenging, primarily due to the large uncertainty on the localisation, which is often significantly larger than the field of view of most instruments. A smart pointing strategy significantly enhances the chance of rapidly observing the true position of the underlying compact binary merger event and so to detect an electromagnetic counterpart.

To address this challenge, we introduce tilepy, a software solution that has been developed and successfully deployed by the H.E.S.S. collaboration during the O2 and O3 observational runs to search for a very-high energy counterpart to GWs events. The optimised tiling strategies implemented in tilepy allowed H.E.S.S. to be the first ground facility to point toward the true position of GW170817. In this presentation, we outline the key features of the now publicly available tilepy software package and showcase its adoption by multiple Imaging Atmospheric Cherenkov Telescopes (IACTs) for GW alert follow-up during the ongoing O4 observational campaign.

In addition, the tilepy software is now also integrated into the Astro-COLIBRI platform. This tool helps in the planning of follow-up of a large range of transient phenomena including GW alerts. The platform also provides an overview of the multi-wavelength context by grouping and visualising information coming from different observatories alongside GW alerts. We will illustrate the use of Astro-COLIBRI in searches for counterparts to GWs.

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