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Neutrino real-time follow-ups with KM3NeT

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KM3NeT is a deep-sea research infrastructure comprising two water-Cherenkov neutrino telescopes being constructed in the Mediterranean Sea: ARCA in Italy, aiming at identifying and studying TeV-PeV astrophysical neutrino sources, and ORCA in France, designed to study the intrinsic properties of neutrinos in the few-GeV range. KM3NeT is also able to detect MeV-scale neutrinos expected at core-collapse supernovae. Given the complementary energy ranges they are optimised for, both telescopes can be used to explore neutrino astronomy from a few MeV to a few PeV, although their different primary goals. The KM3NeT observatory takes an active role in the real-time multi-messenger searches, which allow to study transient phenomena by combining information from the simultaneous observation of complementary cosmic messengers with different observatories. A key aspect to increase the discovery potential of transient sources and refine the localization of poorly localized triggers, such as gravitational waves, is the real-time distribution of alerts when potentially interesting events are detected. In this context, the KM3NeT real-time analysis framework is continuously reconstructing all ARCA and ORCA events, performing follow-ups of external alerts received from other multi-messenger instruments and searching for core-collapse supernova events. The selection of a sample of interesting events to send alerts to the external multi-messenger community is still under definition. This contribution deals with the latest results of the real-time follow-ups of external alerts with the KM3NeT real-time analysis framework.

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