Multi-messenger observations with the KM3NeT telescope: search for high energy neutrinos coinciding with fast radio bursts

Félix Bretaudeau[1] for the KM3NeT Collaboration
[1]SUBATECH, IMT Atlantique, CNRS-IN2P3, Nantes Université

The KM3NeT experiment is a next-generation neutrino telescope, consisting of two separate detection structures, organised as arrays of light sensors, and immersed in the depths of the Mediterranean Sea. The two detectors are the **O**scillation **R**esearch with **C**osmics in the **A**byss detector (ORCA), located off the coast of France and the **A**strophysics **R**esearch with **C**osmics in the **A**byss detector (ARCA), off the coast of Sicily. Identical in the design but differing by scale, these two detectors observe neutrinos decays in the sea water through Cherenkov light produced by the decay products, at different energy ranges. Specifically, ORCA aims at detecting atmospheric neutrinos to study their oscillation parameters, while ARCA will focus at higher energies on astrophysical neutrinos and the characterisation of their sources. Among the latter, Fast Radio Bursts (FRB) are good candidates for a multi-messenger emission, due to the huge energy involved in the burst in their highly magnetised and dense environment. I will present the method and criteria of a multi-messenger analysis, intended to search for spatial and temporal coincidences of astrophysical neutrino signals from KM3NeT with a FRB catalogue of around 800 sources among which 14 have been observed in the period ranging from January 2020 to March 2021, and were visible from the KM3NeT site.