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Search for high energy neutrinos in KM3NeT in coincidence with Fast Radio Bursts

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The KM3NeT experiment is a next-generation neutrino telescope, consisting of the ORCA and ARCA detectors, organised as 3D arrays of light sensors, and immersed in the depths of the Mediterranean Sea. Identical in their design but differing by scale, ORCA aims at detecting neutrinos in the GeV-TeV range, while ARCA will focus on higher energies in the TeV-PeV range. Both detectors can contribute to the study of multi-messenger phenomena, that is observing different types of astrophysical messengers from the same source to infer the multiple aspects of the emitting source. Typically, these messengers are neutrinos, cosmic rays, gravitational waves and electromagnetic radiations.
Among the latter, Fast Radio Bursts (FRB) are good candidates for multi-messenger emissions due to the huge energy involved in their bursts. However, neutrino emissions from FRB sources are poorly constrained by models, which motivates a search across both detector energy ranges and does not exclude temporal coincidences. In this contribution, 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 the ARCA and ORCA detectors with a FRB catalogue on which a selection has been applied, taking into account the date and location of the observed bursts.

Poster prize

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