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## The Multi-Messenger Search Programme and Results of the ANTARES Neutrino Telescope

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The key-word of modern astronomy and astrophysics is multi-messenger: not only photons used as probes for the investigation of the Universe, but also cosmic-rays, neutrinos and gravitational waves. Joining the efforts and skills of different experiments and collaborations, additional tools for data analysis can be enabled. The multi-messenger approach is important in particular for neutrino detectors: potential astrophysical sources are predicted to emit a very faint neutrino signal and the presence of an isotropic flux of atmospheric background requires the development of effective search strategies. The multi-messenger approach is a valid procedure, since it can increase the discovery potential by observing the same source with different probes. Moreover, the statistical significance of the observations can be improved by coincident detection (sustained by the development of alert systems between the experiments) and the efficiency of the detection can be refined profiting of relaxed cuts. The advantages of the multi-messenger approach are evident, in particular, when looking at transient or flaring sources.

In ANTARES (Astronomy with a Neutrino Telescope and Abyss environmental RESearch), a wide programme of multi-messenger searches is active. The strongest connection is with Gamma Astronomy, since both gamma-rays and neutrinos are expected from cosmic emitters if hadronic processes take place. Several studies have been carried on, looking for neutrino signals from gamma-flaring sources (as blazars and microquasars) and from Gamma-Ray Bursts. Public data of Fermi-LAT, SWIFT, RXTE and of observatories in the GCN (Gamma-ray Coordination Network) have been used for the search. Public data of the Pierre Auger Observatory have been used for another study, aiming at the search for a correlation between ANTARES neutrinos and ultra-high-energy cosmic rays. In addition, ANTARES has promoted the TAToO project (Telescopes/ANTARES Target of Opportunity), for the optical follow-up of neutrino alerts for the study of transient sources (GRBs, SNaE), and the GWHEN working group (Gravitational Waves and High Energy Neutrino), for which a set of selected ANTARES candidate neutrino events have been used to “trigger” the data analysis of gravitational wave observatories VIRGO/LIGO. The above mentioned activities and results of the ANTARES Multi-Messenger Programme will be presented and discussed in this contribution.

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