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Search for neutrinos from transient sources with the ANTARES telescope and optical follow-up observations

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The ANTARES telescope is well suited to detect neutrinos produced in astrophysical transient sources as it can observe a full hemisphere of the sky at all the times with a duty cycle close to unity. Potential sources include Gamma-Ray Bursts (GRBs), Core Collapse Supernovae (CCSNe), and flaring Active Galactic Nuclei (AGNs).

To enhance the sensitivity of ANTARES to such sources, a new detection method based on coincident observations of neutrinos and optical signals has been developed. A fast online muon track reconstruction is used to trigger a network of small automatic optical telescopes. Such alerts are generated one to two times per month for special events such as two or more neutrinos coincident in time and direction, or single neutrinos of very high energy.

Since February 2009, ANTARES has sent 29 alert triggers to the TAROT and ROTSE telescope networks, 19 of which have led to follow-up observations. First results on the optical image analysis to search for GRB and core collapse SNe will be presented.

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