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Search for neutrino emission in gamma-ray flaring blazars with the ANTARES telescope

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The ANTARES telescope observes a full hemisphere of the sky all the time with a duty cycle close to 100%. This makes it well suited for an extensive observation of the neutrinos that can be produced in astrophysical transient sources.

In the surrounding medium of the blazars, i.e. active galactic nuclei with their jets pointing almost directly through the observer, neutrinos may be produced together with gamma-rays by hadronic interactions, so it is expected a strong correlation between neutrinos and gamma-rays emissions. This information can be provided by the gamma-ray light curves measured by the LAT instrument on-board the Fermi satellite, which reveals the time variability information of the studied sources. If the expected neutrino flux observation is reduced to a narrow window around the assumed neutrino production period, the background and point-source sensitivity can be drastically reduced.

The ANTARES data collected in 2008 has been analysed looking for the neutrinos detected in the high state period of nine bright and variable Fermi sources and assuming the gamma-ray light curves as the neutrino emission time distributions. First results show a sensitivity improved by a factor 2-3 with respect to a standard time-integrated point source search. The analysis has to be done with an unbinned method based on the minimization of a likelihood ratio, applied to a subsample data of ~60 days of live time, with typical widths for the flare ranging between 1 and 20 days.

Authors: SÁNCHEZ LOSA, Agustín (IFIC (Spain)); DORNIC, Damein (IFIC (Spain))

Presenter: SÁNCHEZ LOSA, Agustín (IFIC (Spain))

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