

Search for high energy neutrinos from bright GRBs with ANTARES

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The ANTARES telescope is currently the largest neutrino detector of the Northern Hemisphere, fully operational since 2008. The search for high-energy neutrinos from astrophysical sources is one of the main purposes of the ANTARES scientific project; among them gamma-ray bursts are thought to be site of hadronic acceleration, thus neutrinos are expected from the decay of charged mesons, produced in $p\gamma$ interactions. The methods and the results of a search for neutrinos from the brightest GRBs observed between 2008 and 2013 are presented. Two scenarios of the fireball model have been investigated: the internal shock scenario, leading to the production of high-energy neutrinos, and the photospheric scenario, characterized by a low energy component in neutrinos spectrum due to the assumption of neutrinos production closer to the central engine. Since no events have been detected in time and space coincidence with these bursts, ANTARES upper limits at 90% C.L. on the expected neutrinos fluxes are derived. Such non detections allow us to directly constrain the bulk Lorentz factor of the jet and the baryon loading.

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