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Observation of the cosmic ray shadow of the Sun with the ANTARES neutrino telescope

One of the main goals of the ANTARES neutrino telescope is the search for point-like neutrino sources. Hence, a reliable method to estimate both the angular resolution and the pointing accuracy of the detector is needed. In this poster we present the study of the Sun "shadow" effect: the shadow is the deficit in the atmospheric muon flux in the direction of the Sun induced by the absorption of the primary cosmic rays. The analysis is based on the ANTARES data sample taken between 2008 and 2017. The Sun shadow effect has been observed with 3.9σ statistical significance and the angular resolution of the telescope for downward-going atmospheric muons has been found equal to 0.45 ± 0.12 degrees. The pointing accuracy is consistent with the expectations and no evidence of systematic pointing shifts has been found.

Mini-abstract

Observation of the cosmic ray absorption by the Sun (Sun shadow) with the ANTARES neutrino telescope

Experiment/Collaboration

ANTARES

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