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Indirect Search for Dark Matter with the ANTARES Neutrino Telescope

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The ANTARES Collaboration is operating the largest water Cherenkov neutrino telescope in the Northern hemisphere. The apparatus, completed in May 2008, comprises 12 detection lines and a multidisciplinary instrumentation line installed at a depth of about 2500 m in the Mediterranean Sea offshore from France.

The goals of ANTARES are, among others, the search for astrophysical neutrino point sources and for neutrinos produced in self-annihilation of Dark Matter particles. In that respect, the most promising sources of neutrino emission are the Sun and the Galactic Center where Dark Matter particles from the galactic halo are expected to accumulate. These particles should produce a clean signal much less affected by astrophysical uncertainties and/or backgrounds than for indirect detection with gamma rays.

Prior to its completion, ANTARES has been taking data for more than a year in an intermediate setup with a 5 and a 10 lines detector configuration.

First results on the search for Dark Matter annihilations in the Sun with the data recorded in 2007 and 2008 are presented, as well as sensitivity studies on Dark Matter searches with the full ANTARES detector and the future large undersea cubic-kilometer neutrino telescope studied by the KM3NeT consortium. A comparison with respect to predictions on neutrino fluxes from Dark Matter annihilations in the framework of CMSSM and UED models will be presented.

Primary author: Mr CHARIF, Ziad (CPPM)

Presenter: Mr CHARIF, Ziad (CPPM)