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Searches for dark matter with the Super-Kamiokande detector

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Indirect searches for dark matter using data collected with the Super-Kamiokande detector in years 1996-2016 were performed. The excess of neutrinos from possible dark matter sources such as Sun, Earth and Galactic Center, compared to the expected atmospheric neutrino background was searched. Event samples including both electron and muon neutrinos covering a wide range of energies were used, with sensitivity to dark matter masses down to tens of GeV. Allowed number of dark matter induced neutrinos which can be contained in SK data so far was estimated. Obtained limits on DM induced neutrino flux were related to limit on spin-dependent (for the Sun) and spin-independent (for the Sun and the Earth's core) WIMP-nucleon cross section. In case of Galactic Center analysis, the upper limit on the self-annihilation cross-section was derived.

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