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Indirect dark matter search using neutrino data recorded by Super-Kamiokande

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Super-Kamiokande (SK), a large water Cherenkov detector located
underground at the Kamioka Observatory in Japan,
can search for weakly interacting massive particles (WIMPs)
by detecting WIMP-induced neutrinos from the Sun and the Milky Way.

An excess of neutrinos from the Sun and Milky Way direction were
searched for compared to the expected atmospheric neutrino background.

For the WIMP search from the Sun, data set of 3902.7 live-time days for fully-contained
(FC) and partially-contained (PC) events and 4206.7 live-time days for upward-going
muon (UPMU) events (collected from 1996 to 2012) were used.
For the WIMP search from the Milky Way, additional data set collected in 2013 and
2014, which in total corresponds to 4223.3 live-time days for FC/PC and
4527.0 live-time days for UPMU events were used.
In these analyses, not only UPMU events but also FC/PC events
with interaction vertices in the detector were used to increase
the signal acceptances.

We found no significant excess over expected atmospheric-neutrino background
and the result is interpreted in terms of upper limits on WIMP-nucleon
elastic scattering or WIMP self-annihilation cross sections.

Summary

Super-Kamiokande (SK), a large water Cherenkov detector located
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can search for weakly interacting massive particles (WIMPs)
by detecting WIMP-induced neutrinos from the Sun and the Milky Way.

An excess of neutrinos from the Sun and Milky Way direction were
searched for compared to the expected atmospheric neutrino background.
We found no significant excess over expected atmospheric-neutrino background
and the result is interpreted in terms of upper limits on WIMP-nucleon
elastic scattering or WIMP self-annihilation cross sections.

In this talk, I will present the result of the indirect WIMP search using
neutrino data recorded by SK.

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