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Exploring the new era of particle physics through the observation of natural neutrinos and the proton decay search

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We studied various kinds of natural neutrinos produced in the atmosphere and stars, including the sun and supernova, to understand the nature of neutrinos using Super-Kamiokande (SK). Recently, we upgraded the SK detector, and now we can identify neutrons with high efficiency with the help of the introduced gadolinium. We are also searching for proton decay with SK. Proton decay is one of the rare experimental proofs of the grand unification theory.

We review the latest results using the SK data achieved by the A01 group in Grant-in-Aid for Scientific Research on Innovation Areas “Exploration of Particle Physics and Cosmology with Neutrinos.”

We are currently constructing the next generation of a gigantic neutrino detector, Hyper-Kamiokande (HK). We have been developing the detector components to maximize its physics capability. We also report the latest status of HK with our achievements.

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