

Shining Light on Cosmogenic Axions with Neutrino Experiments

While most searches for cosmic axions so far focused on their cold relics as (a component of) dark matter, various well-motivated cosmological sources can produce “boosted” axions that remain relativistic today. In this talk I will demonstrate that existing/upcoming neutrino experiments such as Super-Kamiokande, Hyper-Kamiokande, DUNE, JUNO, and IceCube can probe such energetic axion relics. The characteristic signature is the mono-energetic single photon signal from axion absorption induced by the axion-photon coupling. This proposal offers to cover parameter ranges complementary to existing axion searches and provides new opportunities for discovery with neutrino facilities.

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