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Dark matter explanations for the neutrino emission from the Seyfert galaxy NGC 1068

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We investigate the possibility that the high-energy neutrino flux observed from the Seyfert galaxy NGC 1068 originates from dark matter annihilations within the density spike surrounding the supermassive black hole at its center. The comparatively lower gamma-ray flux is attributed to a dark sector that couples predominantly to Standard Model neutrinos. To explain the absence of a corresponding neutrino signal from the center of the Milky Way, we propose two scenarios: (i) the disruption of the dark matter spike at the Milky Way center due to stellar heating, or (ii) the annihilation into a dark scalar that decays exclusively into neutrinos, with a decay length longer than the size of the Milky Way but shorter than the distance from Earth to NGC 1068.

Presenter: AKITA, Kensuke

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