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Solar constraints on captured electrophilic dark matter

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Dark matter captured by interaction with electrons inside the Sun may annihilate via a long-lived mediator to produce observable gamma-ray signals. We utilize solar gamma-ray flux measurements from the Fermi Large Area Telescope and High Altitude Water Cherenkov observatory to put bounds on the dark matter electron scattering cross-section. We find that our limits are four to six orders of magnitude stronger than the existing limits for dark matter masses ranging between GeV to PeV scale.

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