Dark Matters 2022



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Minimal sterile neutrino dark matter

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We propose a novel mechanism to generate sterile neutrinos vs in the early Universe, by converting ordinary neutrinos v α in scattering processes vs v $\alpha \rightarrow$ vs vs. After initial production by oscillations, this leads to an exponential growth in the vs abundance. We show that such a production regime naturally occurs for self-interacting vs, and that this opens up significant new parameter space where vs make up all of the observed dark matter. Our results provide strong motivation to further push the sensitivity of X-ray line searches, and to improve on constraints from structure formation.

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