Abstract Submitted
for the APR20 Meeting of
The American Physical Society

The Dodelson-Widrow Mechanism In the Presence of Self-Interacting Neutrinos[1] WALTER TANGARIFE, Loyola University Chicago, ANDRE DE GOUVEA, MANIBRATA SEN, Northwestern University, YUE ZHANG, Carleton University — keV-scale gauge-singlet fermions, allowed to mix with the active neutrinos, are elegant dark matter(DM) candidates. They are produced in the early universe via the Dodelson-Widrow mechanism and can be detected as they decay very slowly, emitting X-rays. In the absence of new physics, this hypothesis is virtually ruled out by astrophysical observations. Here, we show that new interactions among the active neutrinos allow these sterile neutrinos to make up all the DM while safely evading all current experimental bounds. The existence of these new neutrino interactions may manifest itself in next-generation experiments, including DUNE.

[1]The work of AdG was supported in part by DOE grant DE-SC0010143. MS acknowledges support from the National Science Foundation, Grant PHY-1630782, and to the Heising-Simons Foundation, Grant 2017-228. The research of WT is supported by the College of Arts and Sciences of Loyola University Chicago. The work of YZ is supported by the Arthur B. McDonald Canadian Astroparticle Physics Research Institute

Walter Tangarife
Loyola University Chicago

Date submitted: 03 Jan 2020 Electronic form version 1.4