

Abstract Submitted  
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**Constraining Sterile Neutrino Warm Dark Matter with Chandra Observations of the Andromeda Galaxy** NICHOLAS POLLEY, CASEY WATSON, Millikin University, LI ZHIYUAN, UCLA — We use the Chandra unresolved X-ray emission spectrum from a 12'-28' (2.8-6.4 kpc) annular region of the Andromeda galaxy to constrain the radiative decay of sterile neutrino warm dark matter. By excising the most baryon-dominated, central 2.8 kpc of the galaxy, we reduce the uncertainties in our estimate of the dark matter mass within the field of view and improve the signal-to-noise ratio of prospective sterile neutrino decay signatures relative to hot gas and unresolved stellar emission. Our findings impose the most stringent limit on the sterile neutrino mass to date in the context of the Dodelson-Widrow model,  $m_s < 2.2$  keV (95% C.L.). Our results also constrain alternative sterile neutrino production scenarios at very small active-sterile neutrino mixing angles.

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