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NANOGrav Constraints on Fuzzy Dark Matter BRENDAN DRACHLER, Rochester Institute of Technology, NANOGRAV COLLABORATION — The nature of dark matter remains one of the most perplexing questions in all of astrophysics. The proposed candidates of dark matter currently range from macroscopic objects down to the lowest energy particles ever proposed to exist. Among the many candidates in the low-energy spectrum is fuzzy dark matter (FDM), also called ultralight scalar dark matter, which consists of axions with masses on the order of 10^{-23} eV. The oscillation of the FDM scalar fields pressure can induce oscillations in the gravitational potential which is predicted to be detectable by pulsar timing arrays. We will present results on a search for FDM using the North American Nanohertz Observatory for Gravitational Waves (NANOGrav) 12.5 year dataset as well as a retroactive search using the NANOGrav 11 year dataset. We will also present upper limits on the amplitude and frequency of the oscillations in the gravitational potential, and use the upper limits to constrain the possible mass of the FDM axions.

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