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NANOGrav Limits on Continuous Gravitational Waves from Supermassive Black Hole Binaries JUSTIN ELLIS, University of Wisconsin Milwaukee, NANOGRAV COLLABORATION — Gravitational Waves (GWs) are tiny ripples in the fabric of space-time predicted by Einstein's theory of General Relativity. Pulsar timing arrays (PTAs) offer a unique opportunity to detect low frequency GWs in the near future. Such a detection would be complementary to both LIGO and future space based GW efforts. In the low (1e-9 - 1e-7 Hz) frequency band, the expected source of GWs is a stochastic background resulting from the ensemble of supermassive black hole binaries (SMBHBs) formed during the merger of galaxies, and possibly a few nearby/massive sources that will be individually resolvable. In this talk we will discuss continuous wave search efforts using the current NANOGrav data releases. We will briefly outline both Bayesian and Frequentist search and upper limit pipelines and present preliminary results for sky averaged and targeted upper limits on the strain amplitude using both techniques. Finally we present sensitivity projections for future NANOGrav observations and comment on the plausibility of detection based on current simulations of SMBHBs.

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