Abstract Submitted
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Evolution of limits on the gravitational-wave stochastic background using the NANOGrav 11-year dataset[1] JEFFREY HAZBOUN, Univ of Texas, Rio Grande Valley, NANOGRAV COLLABORATION — The North American Nanohertz Observatory for Gravitational Waves (NANOGrav) is a collaboration of scientists who monitor an array of millisecond pulsars as a galactic-scale gravitational-wave observatory. The timing precision of these pulsars is reaching a level ($\sim$ 100 ns) where one can measure the expected (Hellings and Downs) correlations between pulsars to look for the signature of ultra-low-frequency gravitational waves. Since the maximum power of the stochastic background of gravitational waves from super-massive black hole binaries is thought to be at frequencies smaller than 1/yr, the signal is expected to grow slowly as we are able to observe for longer durations and as we add more pulsars to our array. With the most recent data release, we have undertaken an investigation into the evolution of our signal by slicing the dataset in time and running our statistical analyses on its subsets. We will demonstrate how this technique can be used to assess various characteristics of our pulsar timing array, including the effect of losing one of our telescopes, how removal of our best-timed pulsar affects our limits, and expectations about the evolution of our signal in the future. The investigation into unexpected features of the evolution will also be discussed.

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