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The NANOGrav Nine-year Data Set: Limits on the Anisotropic Gravitational Wave Background CHIARA MINGARELLI, Caltech, NANOGRAV COLLABORATION — Pulsar Timing Arrays are sensitive to gravitational waves (GWs) in the 1 nHz - 100 nHz frequency band. In this low-frequency regime, we expect to measure a stochastic GW background originating from the superposition of GWs from the cosmic population of supermassive black hole binaries. Previous NANOGrav limits on the stochastic GW background have assumed an isotropic distribution of the GW power. Here we look for power in higher order modes using a spherical harmonic decomposition of the GW power on the sky, and show that we can inject single sources of GWs and recover them with this formalism. We present new limits on the power in multipole moments up to l=5; the angular resolution of NANOGrav.

Chiara Mingarelli
Caltech

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