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Reaching diffraction-limited resolution with coherent pulsar timing arrays

Saturday 1 November 2025 11:00 (15 minutes)

In Jow et al. 2025, we calculate the angular resolution of an incoherent PTA using polarized map-making techniques to reconstruct the GW sky. We extend this technique to a coherent analysis by exploring the effects of well constrained pulsar distance measurements on gravitational wave localization. We place estimates on the number of well constrained pulsar distances necessary to reach diffraction-limited localization of single, polarized GWs and find it to be a modest number. This work highlights a fundamental shift in PTA analysis as projected observational advancements move us beyond stochastic background detection and into the regime of PTAs as point source telescopes.

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