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Center for Gravitational Wave Astronomy, University of Texas at Brownsville WILLEM VAN STRATEN, Center for Gravitational Wave Astronomy, University of Texas at Brownsville — As a tool of modern astrophysics, high-precision pulsar timing has yielded the strongest constraints on theories of strong-field gravitation; it is also predicted to directly detect the stochastic background of gravitational waves from supermassive black hole binary systems. Fundamental to every pulsar timing experiment is a measurement known as the pulse time-of-arrival (TOA), the epoch at which a fiducial phase of the pulsar's periodic signal is received at the observatory. Pulse TOAs are typically measured using only the observed total intensity of the pulsed radio emission. A new technique is presented that exploits the additional timing information available in the polarization of the pulsar signal. For a number of millisecond pulsars, TOAs derived from polarization data are predicted to exhibit greater precision and accuracy than those derived from the total intensity alone.

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