

Abstract Submitted
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Supermassive **Black-Hole**
Binary Candidates in the Gravitational-Wave Regime from the Dark
Energy Survey A. MIGUEL HOLGADO, YU-CHING CHEN, XIN LIU, WEI-
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ENDL, ERIC MORGANSON, University of Illinois at Urbana-Champaign — The
cosmic supermassive black-hole (SMBH) binary population is the main contributor
to the stochastic nanohertz gravitational-wave background that pulsar timing arrays
(PTAs) seek to detect. In the electromagnetic window, time-domain surveys have
been systematically searching for such gravitational-wave driven SMBH binaries that
may reside in periodic quasars. We present new SMBH binary candidates from the
Dark Energy Survey that show statistically significant periodicity in their multi-
band light curves. With these candidates, we test models of circumbinary accretion
variability and relativistic Doppler-boosting. We also investigate gravitational-wave
implications for PTAs, like the NANOGrav PTA, and for the LISA mission.

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