Abstract Submitted
for the DAMOP20 Meeting of
The American Physical Society

Search for Exotic Field Emission from the GW170817 Binary Neutron Star Merger Using GPS Atomic Clocks[1] COLIN BRADLEY, DAILEY CONNER, ARKO PRATIM SEN, University of Nevada, Reno, PAUL A. RIES, Jet Propulsion Lab, California Institute of Technology, BLEWITT GEOFFREY, DEREVIANKO ANDREI, University of Nevada, Reno — Bosonic fields beyond the standard model of particles are proposed as constituents of dark matter and dark energy, and they appear as potential solutions to the strong-CP and hierarchy problems. These fields interact feebly with the standard model particles and fields; therefore, precision quantum sensors are an ideal candidate for detection. We focus on fields generated from highly energetic astrophysical events such as binary neutron star and binary black hole mergers and look for their signatures in GPS atomic clock data. For these signatures to be correlated with LIGO triggers, the fields must be ultrarelativistic and ultralight. We implement the excess power statistic method and search for exotic field signatures in GPS clock data near the binary neutron star merger measured by LIGO in August of 2017 (GW170817).

[1]Supported in part by the National Science Foundation

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Date submitted: 06 Feb 2020 Electronic form version 1.4