Gravitational searches for compact dark matter objects

CHARLES HOROWITZ, Indiana Univ - Bloomington, RUDOLF WIDMER-SCHNIDREG, Institute of Geodesy, Stuttgart University, Stuttgart, Germany — Dark matter could be composed of compact dark objects (CDOs). These objects may interact very weakly with normal matter and could move freely inside astronomical bodies. We calculate the expected gravitational wave (GW) signal for a CDO merging with a galactic neutron star. We search data from the first advanced LIGO observing run for GWs from close CDO binaries orbiting inside the Sun. A CDO moving in the inner core of the Earth will have an orbital period near 55 min and produce a time dependent signal in a gravimeter. Data from superconducting gravimeters rule out such objects moving inside the Earth unless their mass $m_D$ and or orbital radius $a$ are very small so that $m_D a < 1.2 \times 10^{-13} M_E R_E$. Here $M_E$ and $R_E$ are the mass and radius of the Earth [1912.00940, Phys. Rev. Let. in press].

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