

Directional model-independent search for persistent gravitational waves in Advanced LIGOs data from the first two observing runs

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In this work, we perform a model-independent search for persistent gravitational waves using Advanced LIGO's data from the first (O1) and the second (O2) observing runs. First, we look for narrowband point-sources in directions of Scorpius-X1, Supernova 1987A, and the Galactic Centre. Second, we look for broadband point-sources over the entire sky. Finally, we look for extended sources of gravitational waves using spherical harmonics decomposition. No evidence of persistent gravitational waves is found. We place upper limits on gravitational wave strain from narrowband point sources, on energy density from extended sources, and on flux from broadband point sources. A marginally significant narrowband outlier is found at ≈ 36.06 Hz in the O2 data, but we conclude it is not consistent with a persistent gravitational wave source, as its significance diminishes when combining O2 and O1 data.

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