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Einstein@Home all-sky search for continuous gravitational waves in LIGO O2 public data BENJAMIN STELTNER, MPI for gravitational physics, M. ALESSANDRA PAPA, MPI for gravitational physics U. Wisconsin Milwaukee, HEINZ-BERND EGGENSTEIN, MPI for gravitational physics, BRUCE ALLEN, MPI for gravitational physics U. Wisconsin Milwaukee, VLADIMIR DERGACHEV, REINHARD PRIX, BERND MACHENSCHALK, OLIVER BEHNKE, MPI for gravitational physics, SYLVIA ZHU, DESY, SINEAD WALSH, MPI for gravitational physics U. Wisconsin Milwaukee — We present results from an all-sky search for continuous gravitational waves in the LIGO O2 data from the Hanford and Livingston detectors. We search for nearly-monochromatic signals with frequency between 20.0 Hz and 585.15 Hz and spin-down between $-2.6\text{e-}9$ Hz/s and $2.6\text{e-}10$ Hz/s. We deploy the search on the Einstein@Home volunteer-computing project and follow-up the waveforms associated with the most significant results with eight further search-stages, reaching the best sensitivity ever achieved by an all-sky survey up to 500 Hz. Six of the inspected waveforms pass all the stages but they are all associated with fake signals simulated at the LIGO detector for validation purposes. We recover all these fake signals with consistent parameters. No other waveform survives, so we find no evidence of a continuous gravitational wave signal. We constrain the h_0 amplitude of continuous gravitational waves at the detector as a function of the signal frequency, in half-Hz bins. The most constraining upper limit at 163.0 Hz is $h_0 = 1.3\text{e-}25$, at the 90% confidence level. Our results exclude neutron stars rotating faster than 5 ms with equatorial ellipticities larger than $1\text{e-}7$ closer than 100 pc.

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