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Search for continuous gravitational waves from twelve young supernova remnants with a hidden Markov model MARGARET MILLHOUSE, LUCY STRANG, ANDREW MELATOS, Univ of Melbourne — Continuous gravitational waves remain an appealing but as-yet-undiscovered detection prospect in gravitational-wave astronomy. Non-axisymmetric neutron stars may emit continuous gravitational waves at a frequency proportional to their rotation frequency. Continuous waves from rapidly rotating neutron stars, such as those found in some young supernova remnants, may fall in the sensitivity band of the Laser Interferometer Gravitational-Wave Observatory (LIGO). Using a hidden Markov model (HMM) framework, we perform a semi-coherent search for gravitational-wave signals from twelve young supernova remnants in public data from LIGO's second observing run. An HMM is robust to spin-wandering, and can track rapid frequency evolution without explicitly searching over the first derivative of the frequency. This makes the search computationally efficient, and able to search over large stretches of data.

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