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Searching for Gravitational Waves from Unknown Galactic Neutron Stars – Evaluation of the PowerFlux Pipeline ORION SAUTER, KEITH RILES, Univ of Michigan - Ann Arbor, VLADIMIR DERGACHEV, California Institute of Technology — Isolated rotating neutron stars with significant non-axisymmetry can emitgravitational radiation ofnearly constant frequency and amplitude. Because theresultingamplitudes are expected to be extremely weak, long time integrations must be carried out to detect a signal. This task is made difficult in all-sky searches for unknown galactic stars by the motion of the Earth(daily rotation and orbital motion)which induces substantial, location-dependent modulations of detected frequency and amplitude. Severalsoftware pipelines havebeen developed to search for such signals in recent data from Advanced LIGO.An evaluation of the performances of these pipelines in data containing instrumental artifacts has been carriedout in a mock data challenge, using software injections in Initial LIGO data, We present here the performance of the PowerFlux search program in a search band of 40-2000 Hz, including detection of "blind" injections. The program uses a multi-stage hierarchical algorithm, based on semi-coherent and loosely coherent power sums. Results indicate that PowerFlux is well suited toanalysis of Advanced LIGO data.

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