

# Cluster characterization and veto analysis of the FrequencyHough all-sky continuous gravitational wave search

Cain Gantt

*Georgia College and State University, Milledgeville, GA 31061, USA*

Pia Astone

*INFN, Sezione di Roma, I-00185 Roma, Italy*

(Dated: August 3, 2019)

Continuous gravitational waves (CWs) can be produced by rotating neutron stars with an asymmetric mass distribution about their axis of rotation. The FrequencyHough search is an all-sky search for these signals, and the large parameter space considered introduces computational limits into the pipeline. We investigate the distributions of candidates produced by earlier stages in the pipeline, and propose the mechanisms within the pipeline that produce these effects. We also characterize the performance of two steps, a veto and ranking procedure, used to reduce the number of candidates within the FrequencyHough pipeline. We found the distance metric in the parameter space is an effective tool to compare the similarity between candidates but is not as effective for comparing clusters formed from those candidates.