Abstract Submitted for the APR17 Meeting of The American Physical Society

LIGO detector characterization with genetic programming MARCO CAVAGLIA, KAI STAATS, Univ of Mississippi, LUCIANO ERRICO², University of Naples, KENTARO MOGUSHI, Univ of Mississippi, HUNTER GABBARD, Albert-Einstein-Institut, Hannover Germany — Genetic Programming (GP) is a supervised approach to Machine Learning. GP has for two decades been applied to a diversity of problems, from predictive and financial modelling to data mining, from code repair to optical character recognition and product design. GP uses a stochastic search, tournament, and fitness function to explore a solution space. GP evolves a population of individual programs, through multiple generations, following the principals of biological evolution (mutation and reproduction) to discover a model that best fits or categorizes features in a given data set. We apply GP to categorization of LIGO noise and show that it can effectively be used to characterize the detector non-astrophysical noise both in low latency and offline searches.

Marco Cavaglia Univ of Mississippi

Date submitted: 01 Oct 2016 Electronic form version 1.4

¹National Science Foundation award PHY-1404139

²Also at University of Mississippi