Abstract Submitted
for the APR11 Meeting of
The American Physical Society

Compact binary coalescence searches with low latency: why and how NICKOLAS FOTOPOULOS, LIGO Laboratory, California Institute of Technology, KIPP CANNON, Canadian Institute for Theoretical Astrophysics, MELISSA FREI, The University of Texas at Austin, CHAD HANNA, Perimeter Institute for Theoretical Physics, DREW KEPPEL, Max Planck Institute for Gravitational Physics, STEPHEN PRIVITERA, LEO SINGER, LIGO Laboratory, California Institute of Technology — Low-latency gravitational-wave (GW) detection of a compact binary coalescence (CBC) will allow electromagnetic (EM) followups to observe earlier parts of the corresponding lightcurves, which are brighter, convey more information about the progenitor system, and allow a more confident association of GW and EM transients. Conventional matched filter banks, common in CBC searches, are computationally efficient, but incur a latency of many minutes. Searches with latencies of seconds and significantly increased throughput are achievable with techniques such as principal component analysis, to reduce the number of filtered templates, hierarchical detection with singular value decomposition byproducts, and exploitation of the quasi-monochromatic structure of chirps to filter time-slices at different sample rates. We present an implementation of these ideas called LLOID, based on the LSC Algorithm Library and the GStreamer multimedia framework.

Nickolas Fotopoulos
LIGO Laboratory, California Institute of Technology

Date submitted: 14 Jan 2011 Electronic form version 1.4