

Abstract Submitted  
for the APR15 Meeting of  
The American Physical Society

**Integrated GW-EM Follow-up Analysis** KENDALL ACKLEY, STEPHEN EIKENBERRY, SERGEY KLIMENKO, Univ of Florida - Gainesville, LSC COLLABORATION — Advanced Gravitational-Wave (GW) detectors such as Advanced LIGO and Advanced Virgo are expected to become operational for observation runs in 2015, with an expected ultimate improvement in sensitivity over previous configurations by a factor of 10 by 2019. There are many potential electromagnetic (EM) counterparts to GWs including short and long gamma-ray bursts (GRBs) and kilonovae. While SGRBs and LGRBs predominantly emit in the X-ray, and the recently-observed kilonova primarily in the infrared, all three sources are expected to have detectable traces in the optical band, albeit requiring very sensitive optical telescopes. In order to aid in the optimization of GW trigger follow-up procedures, we perform an end-to-end analysis feasibility study using synthesized Advanced detector data simulating a GW detection with a theoretical EM counterpart injected into archival optical images. We use images from Robotic Optical Transient Search Experiment (ROTSE) and Palomar Transient Factory (PTF), and inject candidate events following observed lightcurves of SGRBs, LGRBs, and kilonovae. The use of Zernike PSF decomposition on candidate objects offers a fast way to identify point sources, speeding up the automated identification of transient sources in the images. We present our method of transient recovery and the latest results of our feasibility study of a joint GW-EM observation.

Kendall Ackley  
Univ of Florida - Gainesville

Date submitted: 09 Jan 2015

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