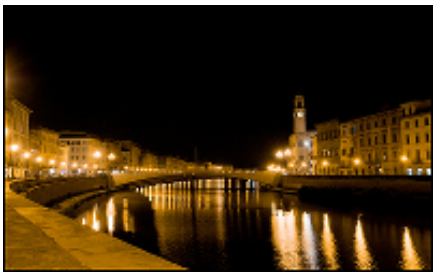

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Searches for Gamma-ray Counterparts to Gravitational-Wave Sources with the Fermi Gamma-ray Space Telescope

Tuesday, 18 October 2016 09:55 (25 minutes)

A new era for astronomy has begun as the first detection of Gravitation Wave (GW) event arising from the coalescence of two stellar-mass Black Holes (BH) was announced by LIGO/VIRGO. Searches for electromagnetic (EM) counterpart of GW event is of fundamental importance, as it increases the confidence in the GW detection and helps characterize the parameters of the merger. The Fermi gamma-ray space telescope has the best sensitivity to simultaneously observe a large fraction of the sky from 10 keV to more than 300 GeV, providing the unique capability of rapidly covering the entire probability region from a LIGO candidate. In this talk, I will present the strategy for follow-up observations of GW event with the Fermi Large Area Telescope (LAT), focusing on the results from the first observing run O1, where LAT upper limits were reported. As advanced LIGO and VIRGO begin operations, we eagerly anticipate the detection GW in coincidence with a gamma-ray signal from the Fermi Gamma-ray Burst Monitor (GBM) and the LAT, likely from a short Gamma-Ray Burst (GRB) arising from the merger of two neutron stars or a black hole and a neutron star. Offline searches for weak GRBs that fail to trigger onboard Fermi indicate that additional short GRBs can be detected in the GBM data and dedicated analysis of LAT data can result in sub-threshold detections that can greatly improve our knowledge of the source of GW event and affect follow-up strategies for counterpart searches by other observatories.

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