

Search for Gravitational Waves Associated with Gamma-Ray Bursts During the Second Advanced LIGO-Virgo Observing Run

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Gamma-ray bursts (GRBs) are one of the most violent phenomena in the universe. They are generally divided into two categories: short-duration bursts created by a collision of two compact sources such as binary neutron stars; and long-duration bursts that are powered by the core collapse of rapidly rotating massive stars. We expect GRBs to be intrinsically linked to gravitational-wave (GW) emission, providing an opportunity for multimessenger astronomy. In this talk, I will present results from targeted GW searches associated with GRBs during the second Advanced LIGO-Virgo observing run. We have analyzed 42 (98) GRBs with modeled (unmodeled) searches and found no candidates other than GW170817. I will briefly discuss the case of GW170817-GRB170817A, as well as results for non-detections: analysis of subthreshold GRB population and lower bounds on the median source distance for various scenarios of GW emission. Finally, I will discuss the implications of these results for source rates and future observing runs.