

BNS Electromagnetic Counterparts: a population study

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Following the historical observation of GW170817 and its electromagnetic follow-up, new multi-messenger observations of such events are expected during the present and future observing runs of Ligo-Virgo. The diversity of the observed population of afterglows of these future events is subject to various factors, which are (i) intrinsic, such as the energy of the ejecta, (ii) environmental, such as the ambient medium density or (iii) observational, such as the viewing angle and distance of the source. Through prescribing a population of mergers and modelling their kilonova and their afterglows, we study the diversity of those events to be observed jointly in gravitational waves and electromagnetic bands. We show that the distribution of observed properties of events with a joint detection (e.g. viewing angle, distance, afterglow peak flux, proper motion, etc.) will provide insight on neutron star mergers, their formation channels and their environments, as well as on the geometry of the relativistic ejection.

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