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Interacting Kilonovae: Long-lasting Electromagnetic Counterparts to Binary Mergers in the Accretion Disks of Active Galactic Nuclei

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We investigate the dynamics and electromagnetic (EM) signatures of neutron star–neutron star (NS–NS) or neutron star–black hole (NS–BH) merger ejecta that occur in the accretion disk of an active galactic nucleus (AGN). Since most of the radiation energy has converted from the kinetic energy of merger ejecta, we call such an explosive phenomenon an interacting kilonova (IKN). It should be emphasized that IKNe are very promising, bright EM counterparts to NS–NS/BH–NS merger events in AGN disks.
The peak luminosity of an IKN can be brighter than
10^{44} erg $\cdot$ s^{-1}, with similarity to superluminous supernovae (SLSNe) and tidal disruption events (TDEs). So the IKN could be one of the most energetic stellar optical transients in the universe. One can observe that the UV-optical-IR emission of an IKN can exceed the AGN background. This makes an IKN a very promising EM counterpart of GW events in the AGN disk for observation.

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