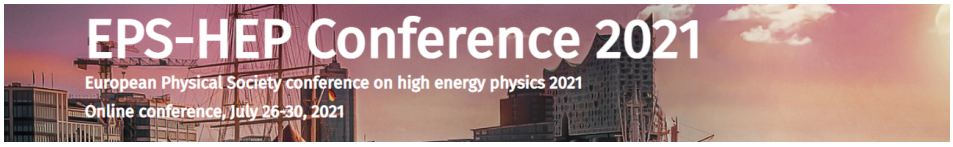

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Jet-induced high-energy neutrino and electromagnetic counterparts of supermassive black hole mergers

Monday 26 July 2021 17:05 (15 minutes)

Supermassive black hole (SMBH) coalescences are ubiquitous in the history of the Universe and often exhibit strong accretion activities and powerful jets. These SMBH mergers are also promising candidates for future gravitational wave detectors such as Laser Space Inteferometric Antenna (LISA). In this work, we investigate the neutrino and electromagnetic counterpart emissions originating from the jet-induced shocks. We formulate the jet structures and relevant interactions therein, and then evaluate neutrino emission from each shock site. We find that month-to-year high-energy neutrino emission from the postmerger jet after the gravitational wave event is detectable by IceCube-Gen2 within approximately five to ten years of operation in optimistic cases where the cosmic-ray loading is sufficiently high and a mildly super-Eddington accretion is achieved. In addition, based on our model that predicts slowly fading transients with durations of ~1–10 months with a time delay from days to months after the coalescence, we discuss implications for EM follow-up observations after the GW detection.

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Collaboration / Activity

N/A

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