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Detectability of a spatial correlation between stellar-mass black hole mergers and Active Galactic Nuclei in the Local Universe

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The origin of the Binary Black Hole (BBH) mergers detected through Gravitational Waves by the LIGO-Virgo-KAGRA collaboration remains debated. One fundamental reason is our ignorance of their host environment, as the typical size of an event's localization volume can easily contain thousands of galaxies. Statistical approaches can be used to assess the spatial correlation between these mergers and astrophysically motivated host galaxy types, such as Active Galactic Nuclei. We used a Likelihood ratio method to infer the degree of GW-AGN connection out to

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