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Normalizing Flows as an Avenue to Studying Overlapping Gravitational Wave Signals

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Because of its speed after training, machine learning is often envisaged as a solution to a manifold of the issues faced in gravitational-wave astronomy. Demonstrations have been given for various applications in gravitational-wave data analysis. In this Letter, we focus on a challenging problem faced by third-generation detectors: parameter inference for overlapping signals. Because of the high detection rate and increased duration of the signals, they will start to overlap, possibly making traditional parameter inference techniques difficult to use. Here, we show a proof-of-concept application of normalizing flows to perform parameter estimation on overlapped binary black hole systems.

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