

PINNGraPE: Physics-Informed Neural Network for Gravitational-wave Parameter Estimation with unmodeled search algorithms

Unmodeled data analysis techniques in the LVK collaboration, particularly coherent Wave Burst (cWB), do not assume any physical constraints when detecting GW events. While this allows for the detection of unmodeled signals with great efficiency, it limits the ability to accurately estimate source properties in the case of CBCs. Physics-Informed Neural Networks (PINNs) offer a promising solution to this challenge, both for LVK and ET unmodeled pipelines: a physics-informed neural network can perform PE while incorporating physical constraints directly into the loss function. This talk will explore how PINNs can address source PE within unmodeled pipelines and will present the latest promising results from the PINNGraPE algorithm.

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