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## swyft Parameter Inference of Gravitational Waves using Machine Learning

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In light of the importance of multi-wavelength characterization of gravitational wave sources, fast parameter inference of gravitational waves is a necessity. However, traditional methods like MCMC take several days to weeks for full parameter inference of GWs. After the promise of GW170817 and the associated multi-wavelength follow-up, the LVC promises several more such detections in the upcoming observing run. We present a faster ( $O(s)$ ) alternative to traditional samplers by using Neural Ratio Estimation to estimate marginals in the  $\sim 15D$  parameter space of a GW signal. For our purposes, we use the **swyft** code and produce results comparable to robust, traditional samplers in a fraction of the time, thus aiding in the quest for low latency EM follow-up.

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