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Swyft: Direct marginal inference for large simulation models

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As cosmology and astrophysics data advance, there is a growing demand for more detailed physical and instrumental simulation models with a multitude of uncertain parameters. Estimating the full joined posterior often becomes computationally prohibitive. Swyft is a deep learning python module that leverages the unique property of simulation-based inference to perform direct marginal inference. It enables to efficiently estimate individual parameter posteriors, perform marginal image reconstruction tasks, or do Bayesian model comparison, without access the joined posterior. I will provide a brief overview of the library and underlying algorithms, and present applications in astroparticle physics and cosmology.

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