

## Z108a Fast differentiable code of one-loop power spectrum of large-scale structure

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Ongoing and upcoming large-scale structure surveys aim to extract cosmological information across a wide range of redshifts and multiple tracer species. This requires the development of efficient analysis tools to explore high-dimensional parameter spaces. We are developing a JAX implementation of the one-loop galaxy power spectrum based on the effective field theory (EFT) of large-scale structure. Our implementation includes all the necessary model components for real data analysis, such as galaxy bias up to third order, redshift-space distortions, UV counterterms, IR resummation, and the Alcock – Paczynski effect. Thanks to auto-differentiability and JIT compilation provided by JAX, our code enables efficient parameter sampling using Hamiltonian Monte Carlo methods. We will describe the details of the implementation and demonstrate its performance in parameter inference.