

Analytic multi-loop results using finite fields and dataflow graphs with FiniteFlow

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I will describe FiniteFlow, a framework for defining and executing numerical algorithms over finite fields and reconstructing analytically multivariate rational functions. The framework employs computational graphs, known as dataflow graphs, to combine basic building blocks into complex algorithms. This allows to easily implement a wide range of methods over finite fields in high-level languages and computer algebra systems, without being concerned with the low-level details of the numerical implementation. This approach sidesteps the appearance of large intermediate expressions and can be massively parallelized. I will show recent applications of this framework, such as analytic results for two-loop five-point scattering and for the four-loop cusp anomalous dimension.

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