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Practical applications of machine-learned flows on gauge fields

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Normalizing flows are machine-learned maps between different lattice theories which can be used as components in exact sampling and inference schemes. Ongoing work yields increasingly expressive flows on gauge fields, but it remains an open question how flows can improve lattice QCD at state-of-the-art scales. I discuss progress of two strategies to employ flows for computational advantage. The first is applications of flows in replica exchange (parallel tempering) sampling, aimed at improving topological mixing, which are viable with iterative improvements upon presently available flows. The second is the use of flows to improve signal to noise in Feynman-Hellmann calculations and related approaches.

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