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Scaling laws for amplitude surrogates

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Fast and precise evaluations of scattering amplitudes even in the case of precision calculations is essential for event generation tools at the HL-LHC. We explore the scaling behavior of the achievable precision of neural networks in this regression problem for multiple architectures, including a Lorentz symmetry aware multilayer perceptron and the L-GATr architecture. L-GATr is equivariant with respect to the Lorentz group by its internal embedding living in the geometric algebra defined by the flat space-time metric. This study addresses in particular the scaling behavior of uncertainty estimations using state of the art methods.

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