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Error Reduction using Machine Learning on Ising Worm Simulation

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We develop a method to improve on the statistical errors for higher moments using machine learning techniques. We present here results for the dual representation of the Ising model with an external field, derived via the high temperature expansion.

We compare two ways of measuring the same set of observables via machine learning: the first gives any higher moments but has larger statistical errors, the second provides only two point function but with small statistical errors. We use the decision tree method to train the correlations between the higher moments and the two point function and use the accurate data of these observable as a input data.

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