

XVth Quark Confinement and the Hadron Spectrum



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Machine Learning Methods in Lattice QCD

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In recent years, machine learning and AI technologies have revolutionized physics, becoming essential in overcoming the enormous computational costs and time constraints faced by traditional methods. This talk will discuss their applications in lattice QCD and related fields. We will introduce new configuration generation methods for lattice QCD using gauge-covariant neural networks and self-learning Monte Carlo methods, as well as the application of transformers respecting global symmetries. These methods excel at capturing long-range correlations, as evidenced by the success of models like ChatGPT and AlphaFold. Additionally, we will cover the use of sparse modeling for spectral function analysis and decision tree algorithms for higher-order $1/D$ estimation, exploring their potential for susceptibility calculations and Taylor expansions.

Primary author: TOMIYA, Akio

Presenter: TOMIYA, Akio

Session Classification: Statistical Methods for Physics Analysis in the XXI Century

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