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Truth, beauty, and goodness in grand unification: A machine learning approach

Monday 19 May 2025 14:15 (15 minutes)

We investigate the flavour sector of the supersymmetric SU(5) Grand Unified Theory (GUT) model using machine learning techniques. The minimal SU(5) model is known to predict fermion masses that disagree with observed values in nature. There are two well-known approaches to address this issue: one involves introducing a 45-representation Higgs field, while the other employs a higher-dimensional operator involving the 24-representation GUT Higgs field. We compare these two approaches by numerically optimising a loss function, defined as the ratio of determinants of mass matrices. Our findings indicate that the 24-Higgs approach achieves the observed fermion masses with smaller modifications to the original minimal SU(5) model.

Mini Symposia (Invited Talks Only)

Plenary (Invited talks only)

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