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Non-perturbative Weak Physics using the FMS Mechanism

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The $SU(2)$ gauge symmetry of the weak sector implies that the Higgs vacuum expectation value has to be gauge variant and hence cannot be a physical observable, even though it is generally regarded as such. The standard perturbative expansion, therefore, has a conceptual flaw that can be resolved using the Fröhlich-Morchio-Strocchi mechanism. In this presentation, we explore the mechanism on the lattice. We will present new results for Higgs and W-boson PDFs from quenched simulations. Further, we present results from simulations with dynamical fermions, identifying different physical regions that exhibit QCD-like and Higgs-like mass hierarchies, where the Higgs is either stable or a resonance. We discuss the operator basis developed to produce lepton scattering lengths from a Lüscher analysis, as well as preliminary spectral functions and extracted scattering amplitudes obtained in the different physical regions.

Parallel Session (for talks only)

Quark and lepton flavor physics

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