

Contribution ID: 477

Type: Parallel session talk

## Unification of Gauge Symmetries ... including their breaking

Wednesday 28 July 2021 11:00 (15 minutes)

In this talk, we present a minimal viable scenario that unifies the gauge symmetries of the SM and their breaking sector. Our Gauge-Higgs Grand Unification setup employs 5D warped space with a SU(6) bulk gauge field that includes both a SU(5) grand unified theory (GUT) and a Higgs sector as a scalar component of the 5D vector field, solving the hierarchy problem. By appropriately breaking the gauge symmetry on the boundaries of the extra dimension the issue of light exotic new states, appearing generically in such models, is eliminated and the SM fermion spectrum is naturally reproduced. The Higgs potential is computed at one-loop, finding straightforward solutions with a realistic mh = 125 GeV. The problem of proton decay is addressed by showing that baryon number is a hidden symmetry of the model. The presence of a scalar leptoquark and a scalar singlet is highlighted, which might play a role in solving further problems of the SM, allowing for example for electroweak baryogenesis. Finally, the X and Y gauge bosons from SU(5) GUTs are found at collider accessible masses, opening a window to the unification structure at low energies.

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Session Classification: T10: Searches for New Physics

Track Classification: Searches for New Physics