



Contribution ID: 29

Type: Talk

Flavour singlet mixing in $Sp(4)$ gauge theory with fermions in multiple representations

Tuesday, 30 July 2024 11:35 (20 minutes)

We study the pseudoscalar flavour-singlet mesons of $Sp(4)$ gauge theory with two distinct fermion representations. The model contains two fundamental and three anti-symmetric Dirac fermion. It is a minimal realization of a composite Higgs scenario with partial top compositeness. We determine both the masses and the mixing angles of the states associated with the global $U(1)$ symmetries, one of which, is expected to be broken by the axial anomaly. These states complete the sector of pseudo-Nambu-Goldstone bosons present in this theory.

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Session Classification: Particle physics beyond the Standard Model

Track Classification: Particle Physics Beyond the Standard Model