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Chimera Baryon Spectrum of the Composite Higgs Model with $Sp(4)$ gauge group

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In the context of Composite Higgs Models, where the standard model Higgs is interpreted as a pseudo Nambu–Goldstone Boson, baryons formed by matter in different representations, known as chimera baryons, could serve as top partners. The chimera baryon sharing the same quantum number as the top quark can mix with it, effectively lifting the mass of the top quark through the see-saw mechanism. We report our results of the spectrum of low-lying chimera baryons in the quenched approximation with the $Sp(4)$ gauge theory. Specifically, we investigate the chiral extrapolation of chimera baryon masses. To accomplish this, we use a fitting function inspired by QCD chiral Effective Field Theory (EFT). We employ a simplified Akaike Information Criterion (AIC) to determine the best fit among different data sets. Additionally, we conduct a sense check on the fitting procedure, confirming its validity and reliability. Last, we present the massless-continuum limit of chimera baryon masses.

Topical area

Particle Physics Beyond the Standard Model

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