

Baryon correlators containing different diquarks from lattice simulations

Presenter: Zhaofeng Liu (University of Colorado at Boulder)

Zhaofeng Liu, Thomas DeGrand

Abstract: Point to point vacuum correlators containing diquarks in the color anti-triplet representation are computed in the quenched approximation with overlap fermions. The scalar, pseudoscalar and axial vector diquarks are combined with light quarks to form color singlets. The scalar (“good”) diquark channel shows a stronger attraction than the axial vector (“bad”) channel and this attraction increases as the quark mass decreases. The pseudoscalar channel shows a repulsion and at small quark masses, the correlator becomes negative (a quenched finite volume artifact). By separating configurations without zero modes from those with zero modes, we find that the zero modes have an important contribution in both the attraction in the scalar channel and the repulsion in the pseudoscalar channel. In the axial vector channel, we do not find apparent zero mode effects. Comparing with meson correlators and instanton liquid models, we see similarities and qualitative consistence.