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## Glueballs in $N_f = 1$ QCD

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We present an evaluation of the glueball spectrum for configurations produced with  $N_f = 1$  dynamical fermions as a function of the  $m_{\text{PCAC}}$  mass. We obtained masses of states that fall into the irreducible representations of the octagonal group of rotations in combination with the quantum numbers of charge conjugation  $C$  and parity  $P$ . Due to the low signal to noise ratio, practically, we can only extract masses for the irreducible representations  $A_1^{++}$ ,  $E^{++}$ ,  $T_2^{++}$  as well as  $A_1^{-+}$ . We make use of the Generalized Eigenvalue Problem (GEVP) with a basis operators consisting only of gluonic operators. Throughout this work we are aiming towards the identification of the effects of light dynamical quarks on the glueball spectrum and how this compares to the statistically more precise spectrum of  $SU(3)$  pure gauge theory. We used large gauge ensembles which consist of  $\sim \text{calO}(10\text{K})$  configurations. Our findings demonstrate that the low lying spectrum of the scalar, tensor as well as pseudo-scalar glueballs receive negligible contributions from the inclusion of  $N_f = 1$  dynamical fermions.

### Topical area

Hadronic and Nuclear Spectrum and Interactions

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