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Chiral field theory of 0^{-+} glueball

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A chiral field theory of 0^{-+} glueball is presented. The Lagrangian of this theory is constructed by adding a 0^{-+} glueball field to a successful Lagrangian of chiral field theory of pseudoscalar, vector, and axial-vector mesons. The couplings between the pseudoscalar glueball field and the mesons are via $U(1)$ anomaly revealed.

Quantitative study of the physical processes of the 0^{-+} glueball of $m = 1.405\text{GeV}$ is presented.

In this talk following topics are presented:

a new chiral field theory of 0^{-+} glueball;
 mass mixing between η , η' , and $0^{-+}(\eta(1405))$ glueball;
 kinetic mixing;

$J/\psi \rightarrow \gamma\eta(1405)$ decay;

$\eta(1405) \rightarrow \gamma\gamma, \gamma\rho, \gamma\omega, \gamma\phi, \gamma\pi\pi, \gamma KK$ decays;

$\eta(1405) \rightarrow \rho\pi\pi$ and strong decays of $\eta(1405)$.

The theoretical predictions can be used to identify the 0^{-+} glueball.

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