Type: Poster

Decays of the vector glueball

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We calculate two- and three-body decays of the (lightest) vector glueball into (pseudo)scalar, (axial-)vector, as well as pseudovector and excited vector mesons in the framework of a model of QCD. While absolute values of widths cannot be predicted because the corresponding coupling constants are unknown, some interesting branching ratios can be evaluated by setting the mass of the yet hypothetical vector glueball to 3.8 GeV as predicted by quenched Lattice QCD. We find that the decay mode $\omega \pi \pi$ should be one of the largest (both through the decay chain $O \rightarrow b \ 1 \ \pi \rightarrow \omega \pi \pi$ and through the direct coupling $O \rightarrow \omega \pi \pi$). Similarly, the (direct and indirect) decay into $\pi KK * (892)$ is sizable. Moreover, the decays into $\rho \pi$ and K * (892)K are, although subleading, possible and could play a role in explaining the $\rho \pi$ puzzle of the charmonium state $\psi(2S)$ thank to a (small) mixing with the vector glueball. The vector glueball can be directly formed at the ongoing BESIII experiment as well as at the future PANDA experiment at the FAIR facility. If the width is sufficiently small (. 100 MeV) it should not escape future detection.

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