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: Decay modes of the pseudoscalar glueball and its first excited state

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We study several chiral Lagrangians that describe the two- and three-body decays of a pseudoscalar glueball, $J^{PC} = 0^{-+}$, with a mass of 2.6 GeV and its first excited state with a mass of 3.7 GeV. Their masses were predicted by lattice QCD simulations. We compute the decay of the pseudoscalar glueball into (pseudo)scalar and (axial-)vector mesons as well as their excited states. We calculate also the decay of the first excited state into light mesons, charmonia, excited states, and into a scalar and pseudoscalar glueball. These states and channels are in reach of the ongoing BESIII, Belle II, LHCb, and NICA experiments and the upcoming PANDA experiment at the FAIR facility. The various branching ratios are parameters-free predictions.

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