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The mixing of η_c and the Pseudoscalar Glueball

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The first lattice QCD study of the mixing of η_c and pseudoscalar glueball was performed.
We generated two large ensembles of gauge configuration with $N_f = 2$ degenerate charm quarks on anisotropic lattices,
with spatial lattice spacing $a_s = 0.1026$ fm and anistropy $\xi = 5$, where the charm sea quark mass was tuned to
give vector charmonium J/ψ mass $m_{J/\psi} = 2743$ and 3068 MeV.
The correlation functions of the charm quark bilinear operator and the glueball operator were calculated
on these ensembles with the charm quark loops computed through the distillation method.
Subsequently the mixing angle between η_c and the psuedoscalar glueball was extracted
to be $7.1(9)^\circ$ and $4.3(4)^\circ$ on these two ensembles, respectively,
which provides an important theoretical input in order to understand the properties of η_c.

Primary authors: Mr ZHANG, Ren-qiang (IHEP); LIU ZHAOFENG, Zhaofeng (Institute of High Energy Physics, CAS); 孙玮 (IHEP); 宫明; Dr 陈, 莹 (高能所); Dr 桂, 龙成 (Hunan Normal University)

Presenter: Mr ZHANG, Ren-qiang (IHEP)

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