Measurement of branching fractions for $J/\psi \to \gamma$ + pseudoscalar and study of η' decay dynamics

Haixuan Chen
for BES Collaboration

Institute of High Energy Physics
Beijing 100049, People's Republic of China

The decay modes $J/\psi \to \gamma\pi^0$, $\gamma\eta$ and $\gamma\eta'$ are analyzed using a data sample of 58 million J/ψ decays collected with the BESII detector at the BEPC. The branching fractions are determined to be: $Br(J/\psi \to \gamma\pi^0) = (3.13^{+0.65}_{-0.47}) \times 10^{-5}$, $Br(J/\psi \to \gamma\eta) = (11.23 \pm 0.89) \times 10^{-4}$, and $Br(J/\psi \to \gamma\eta') = (5.55 \pm 0.44) \times 10^{-3}$, where the errors are combined statistical and systematic errors. The ratio of partial widths $\Gamma(J/\psi \to \gamma\eta')/\Gamma(J/\psi \to \gamma\eta)$ is measured to be 4.94 ± 0.40, and the singlet-octet pseudoscalar mixing angle of $\eta - -\eta'$ system is determined. The decay dynamics of $\eta' \to \gamma\pi^+\pi^-$ is studied using about 22,000 η' decays, the $\pi^+\pi^-$ mass spectrum is compared with various theoretical models.

[1] M. Ablikim *et al.* (BES Collab.), Phys. Rev. **D73**, 052008 (2006)

E-mail: henhx@mail.ihep.ac.cn