ARTICLE

Observation of a Charged Charmoniumlike Structure in e(+)e(-) -> pi(+)pi(-) J/psi at root s=4.26 GeV

Ablikim, M. • Achasov, M. N. • Ai, X. C. • Albayrak, O. • Ambrose, D. J. • An, F. F. • An, Q. • Bai, J. Z. • Ferroli, R. Baldini • Ban, Y. • Becker, J. • Bennett, J. V. • Bertani, M. • Bian, J. M. • Boger, E. • Bondarenko, O. • Boyko, I. • Briere, R. A. • Bytev, V.

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Abstract

We study the process e(+)e(-) -> pi(+)pi(-) J/psi at a center-of-mass energy of 4.260 GeV using a 525 pb(-1) data sample collected with the BESIII detector operating at the Beijing Electron Positron Collider. The Born cross section is measured to be (62.9 +/- 1.9 +/- 3.7) pb, consistent with the production of the Y(4260). We observe a structure at around 3.9 GeV/c(2) in the pi(+/-) J/psi mass spectrum, which we refer to as the Z(c)(3900). If interpreted as a new particle, it is unusual in that it carries an electric charge and couples to charmonium. A fit to the pi(+/-) J/psi invariant mass spectrum, neglecting interference, results in a mass of (3899.0 +/- 3.6 +/- 4.9) MeV/c(2) and a width of (46 +/- 10 +/- 20) MeV. Its production ratio is measured to be R = (sigma(e(+)e(-) -> pi(+/-) Z(c)(3900)(-/+) -> pi(+)pi(-) J/psi)/sigma(e(+)e(-) -> pi(+)pi(-) J/psi)) = (21.5 +/- 3.3 +/- 7.5)%. In all measurements the first errors are statistical and the second are systematic.