

Study on the Two-Photon Transition from $\psi(2S)$ to J/ψ at BESIII

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The two-photon spectroscopy has been always a very fundamental but powerful tool for the study of the excitation level of different size-scale systems, such as molecules, atoms and positronium [1]. Its direct analog to study the process among the quarkonia has yet not well studied in the experiment, especially for the charmonia.

With the high luminosity of electron-positron storage ring at BEPCII and excellent performance of the BESIII spectrometer [2], BESIII accumulated about 100 million $\psi(2S)$ data [3]. With the help of these high statistics and high quality data, the two-photon transition from $\psi(2S)$ to J/ψ was studied at BESIII. The progress will be reported in the conference.

[1] A. Quattronani, F. Bassani, S. Carillo, Phys. Rev. A **25** (1982) 3079.

[2] M. Ablikim *et al.*, Nucl. Instrum. Meth. A **614** (2010) 3.

[3] M. Ablikim *et al.*, Phys. Rev. D **81** (2010) 052005.

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