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ηd threshold structure from the γd→π⁰ηd reaction

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The eta;d threshold structure has been experimentally studied in the gamma;d→pi;⁰eta;d reaction at incident photon energies ranging from the reaction threshold to 1.15 GeV. An enhancement is observed near the eta;d threshold in dsigma;/dM_{eta;d}. The measured angular distribution of deuteron emission dsigma;/dOmega;<sub>d<\sub> is rather flat, which cannot be reproduced by the calculations based on the kinematics of quasi-free pi;⁰eta; production with deuteron coalescence even if the eta;d final-state interaction is incorporated. The spin-parity of 1^{minus;} is consistent for the enhancement with the pi;⁰ and eta; angular distributions for the events with M_{eta;d}<2.47 GeV.Its Breit-Wigner mass and width are limited to 2.34~2.35 and 0~0.06 GeV, respectively, at 99% confidence level, suggesting a possible eta;d bound state. In this talk, we present the eta;d threshold enhancement, and its properties.

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