

Baryon resonance studies at the LEPS2 BGOegg experiment

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Photoproduction of a neutral pion, omega, or eta meson on the proton has been experimentally studied in their neutral decay modes at the LEPS2 BGOegg experiment with incident photon energies ranging from 1.3 GeV to 2.4 GeV. Differential cross sections, photon beam asymmetries, and spin density matrix elements are measured with high statistics and a wide angular region by using a large acceptance calorimeter (BGOegg) and forward-angle charged-particle detectors. Systematic comparisons of them with other experiment data and partial wave analyses are discussed. In particular, a bump structure at $W = 2.0\text{--}2.3$ GeV in the differential cross section of $\gamma p \rightarrow \eta p$ was confirmed at extremely backward η polar angles, where the existing data are inconsistent with each other. This bump structure is likely associated with high-spin resonances that couple with $s\bar{s}$ quarks. The photon beam asymmetries in a wide polar angle range for the photon beam energies above 2 GeV are reported for the first time, providing additional constraints to nucleon resonance studies at high energies. Other recent studies in the BGOegg experiment will also be presented.

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Classificazione della track: Polarization observables photo- and electro- production of mesons off nucleons