

# Spatial extent of $\Delta(1232)$ with $\pi^0\pi^0$ momentum correlations using the high-resolution EM calorimeter BGOegg

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Measuring the properties of hadrons in the non-perturbative QCD energy region is one of the powerful tools to understand the hadron structure and strong interaction. We propose to measure the spatial extent of intermediate baryon resonances and of hadron reaction volume in the non-perturbative QCD energy region. A new method is developed to measure the spatial extent of the  $\Delta(1232)$  resonance involved in the sequential decay process  $p \rightarrow \pi^0 \Delta^+ \rightarrow \pi^0 \pi^0 p$ . The information on the size is given by investigating the Bose-Einstein correlation of these two  $\pi^0$ s. The experiment is carried out at LEPS2 beam line in Spring-8 with the electromagnetic calorimeter BGOegg of nearly  $4\pi$  coverage which enables an unprecedented high-resolution measurement, providing precise data for  $\pi^0\pi^0$  relative momenta. In addition, s-channel resonance contributions coupling to  $\pi^0\pi^0 p$  are weak in the photon-beam energy region of 1.3-2.4 GeV, opening the possibility of selecting a clean sample for examining  $\pi^0\pi^0$  correlations.

## Summary

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