

**ELPH seminar**

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日時: **2022年3月10日(木) 17:00~**

場所: **Zoom** ミーティング

題目: **Evidence of a dibaryon spectrum in coherent  $\pi^0\pi^0$  d photoproduction at forward deuteron angles at the BGOOD experiment**

概要:

The discovery of the  $d^*(2380)$  hexaquark, first identified in the fusion reaction  $pn \rightarrow d \pi^0 \pi^0$  has sparked renewed interest in dibaryon searches in the non-strange sector. Evidence of the  $d^*(2380)$ , with  $IJ^P = 03^+$ , has been observed in a multitude of final states and observables. Conversely, recent models benefiting from high precision experimental data and theoretical developments have described the  $d^*(2380)$  structure via triangle singularity mechanisms without the need of a dibaryon resonance.

The BGOOD experiment at ELSA provides a unique approach to measure such mechanisms via the coherent reaction,  $\gamma d \rightarrow \pi^0 \pi^0 d$ .

The presented results are from threshold to a centre-of-mass energy of 2850 MeV, using a full kinematic reconstruction with final state deuterons identified in the forward spectrometer and  $\pi^0$  decays in the central BGO Rugby Ball. The strength of the differential cross section exceeds what can be described by models of coherent photoproduction and instead supports the three isoscalar dibaryon candidates reported by the ELPH collaboration at 2.38, 2.47 and 2.63 GeV/c<sup>2</sup>. A low mass enhancement in the  $\pi^0\pi^0$  invariant mass is also observed which is consistent with the ABC effect that has been attributed to  $d^*(2380)$  formation. At higher centre-of-mass energies, a narrow peak in the  $\pi^0 d$  invariant mass at 2114 MeV/c<sup>2</sup> with a width of 20 MeV/c<sup>2</sup> supports a sequential two-dibaryon decay mechanism.

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