

# The BGOOD experiment at ELSA - exotic structures in the light quark sector?

Saturday, 24 June 2023 09:00 (30 minutes)

The discoveries of the pentaquark states and  $XYZ$  mesons in the charmed quark sector initiated a new epoch in hadron physics, where the existence of exotic multi-quark states beyond the conventional three and two quark systems has been unambiguously realised. Similar structure may be evidenced in the light,  $uds$  sector in meson photoproduction, where access to a low momentum exchange and forward meson production angles is crucial to study such phenomena. The BGOOD photoproduction experiment is uniquely designed to explore this kinematic region, being comprised of a central calorimeter complemented by a magnetic spectrometer in forward directions.

Highlighted results indicate a peak-like structure in the  $\gamma n \rightarrow K^0 \Sigma^0$  cross section at a centre-of-mass energy of 2 GeV consistent with a meson-baryon interaction model which predicted the charmed  $P_C$  states. The same  $K^* \Sigma$  molecular nature of this proposed  $N^*(2030)$  is also supported in a measurement of  $\gamma p \rightarrow K^+ \Lambda(1405) \rightarrow K^+ \pi^0 \Sigma^0$ , where it is predicted to drive a triangle singularity mechanism. In the non-strange sector, coherent meson photoproduction off the deuteron enables access to proposed dibaryon states, including the recently discovered  $d^*(2380)$ . Data will be presented which support experimental claims of higher mass isoscalar and isovector dibaryons.

Supported by DFG projects 388979758/405882627 and the European Union's Horizon 2020 programme, grant 824093.

## Collaboration

BGOOD

**Primary author:** JUDE, Thomas (University of Bonn)

**Presenter:** JUDE, Thomas (University of Bonn)

**Session Classification:** Plenary session