

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

Thursday, April 20, 2023 12:00 PM (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 this 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.

Primary author: JUDE, Thomas (Bonn University)

Presenter: JUDE, Thomas (Bonn University)

Session Classification: Talks