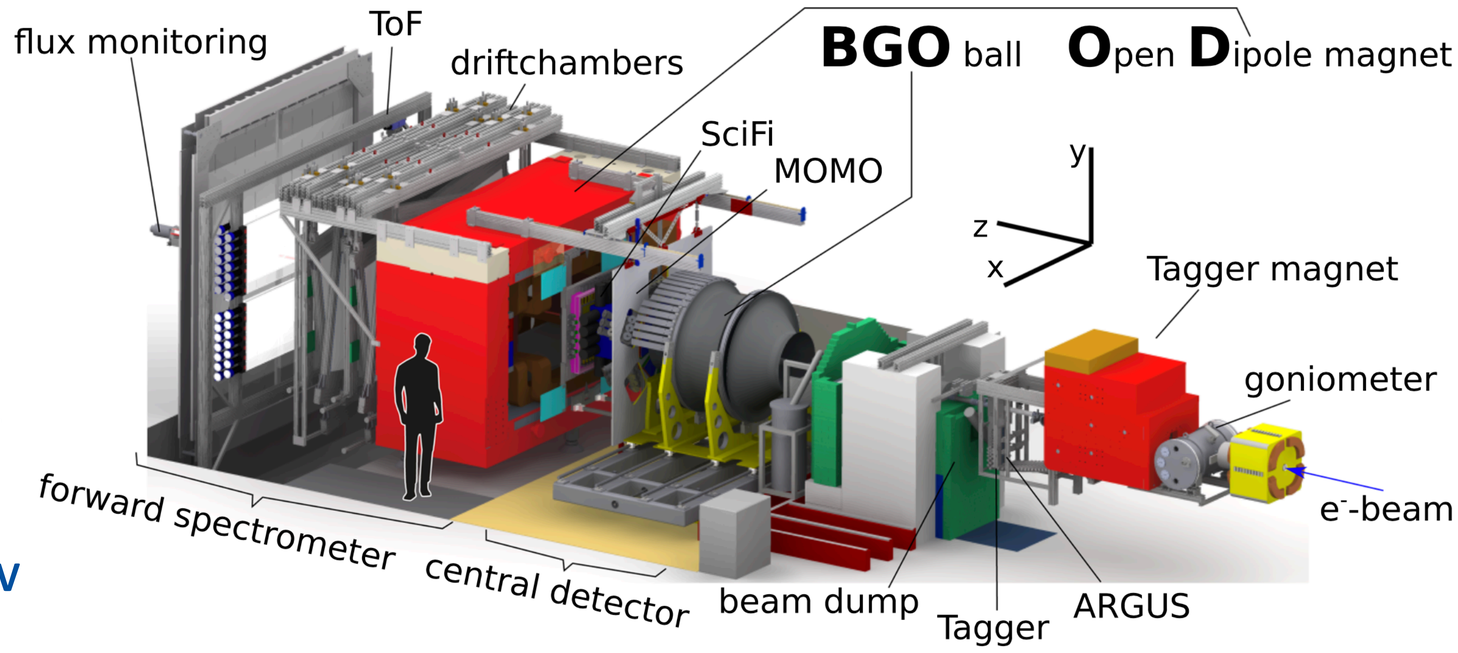
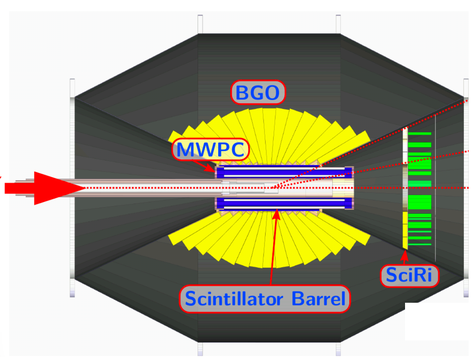
BGOOD at ELSA

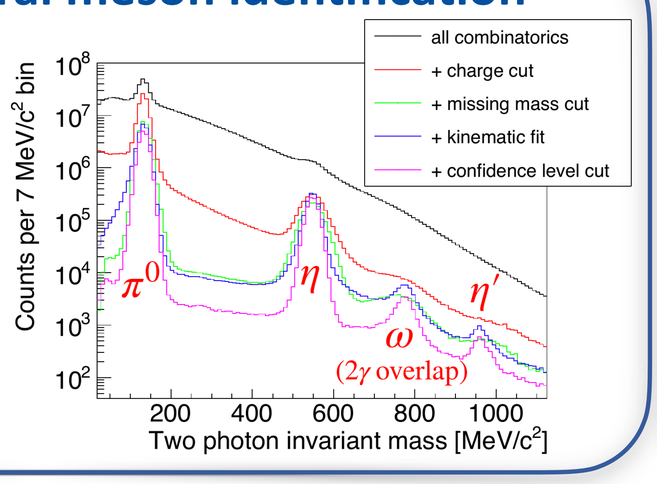
Exotic structures of *uds* quarks?

- **Understanding the emergence of hadronic structure from the basic building blocks of matter**
- **The existence of multi-quark states beyond conventional three & two constituent quark systems has been realised in the charmed quark sector**
- **States in the light, *uds* sector (eg $\Lambda(1405)$) also may have molecular meson-baryon type configurations**
- **To study such states requires low momentum transfer and reconstruction of mixed charged final states**
- **BGOOD is ideally suited - photoproduction up to 3 GeV with charged & neutral particle identification**

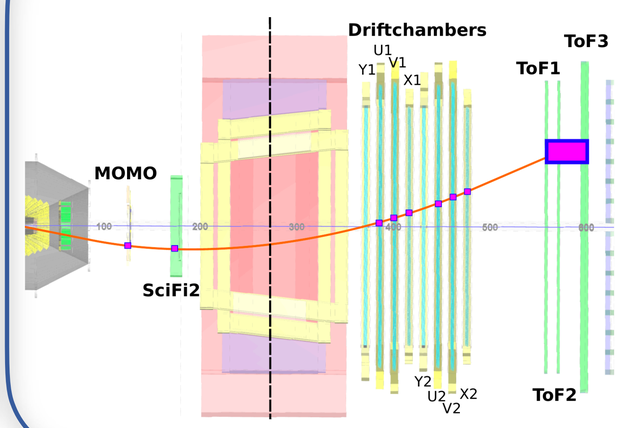


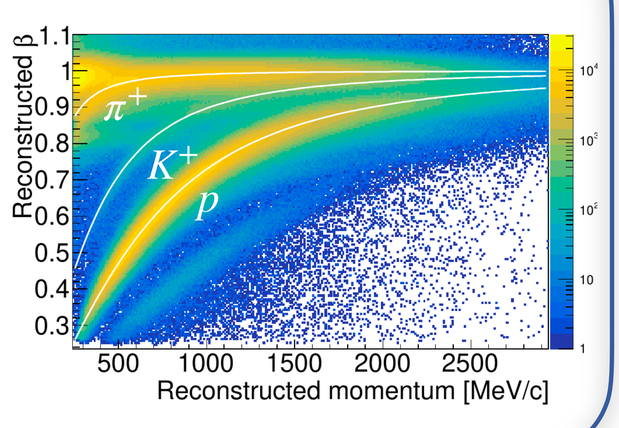
Central region - neutral meson identification





Forward angles - charged particle identification



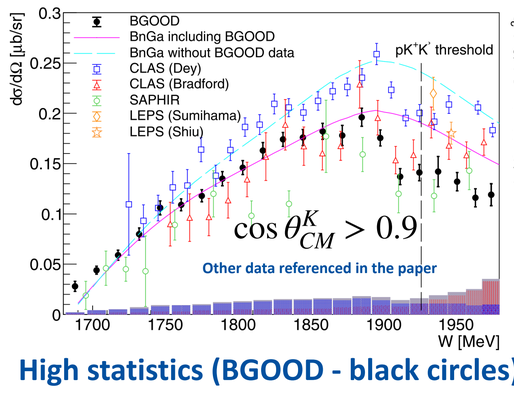


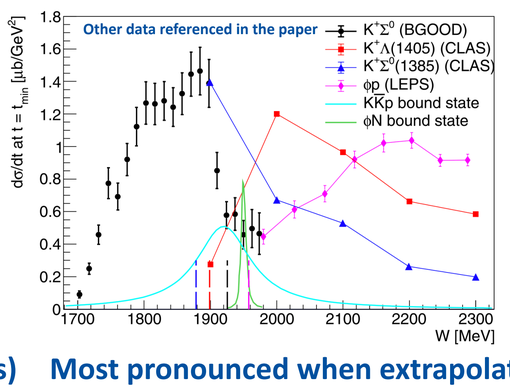
▪ The BGOOD setup at ELSA

S. Alef et al., EPJA 56 (2020) 104

▪ Cusp in $K^+\Sigma^0$ photoproduction

T.C. Jude et al., PLB 820 (2021) 136559



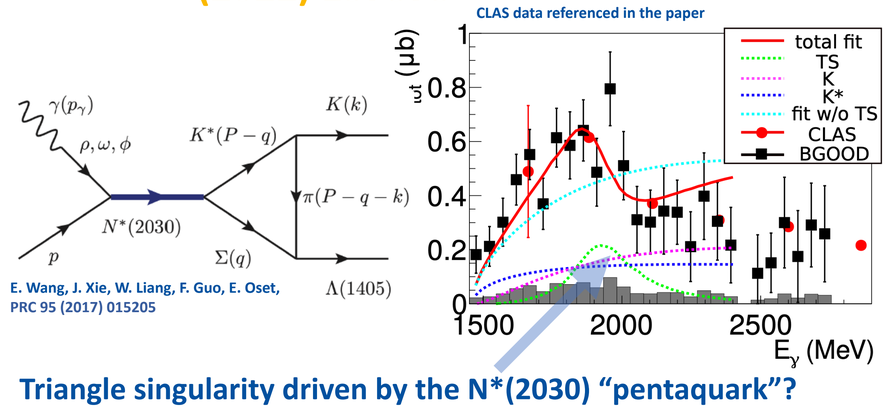


High statistics (BGOOD - black circles) reveals a cusp at the K^+K^-p threshold

Most pronounced when extrapolated to exactly forward going K^+

▪ $K^+\Lambda(1405) \rightarrow K^+\pi^0\Sigma^0$

G. Scheluchin, T.C. Jude et al., PLB 833 (2022) 137375

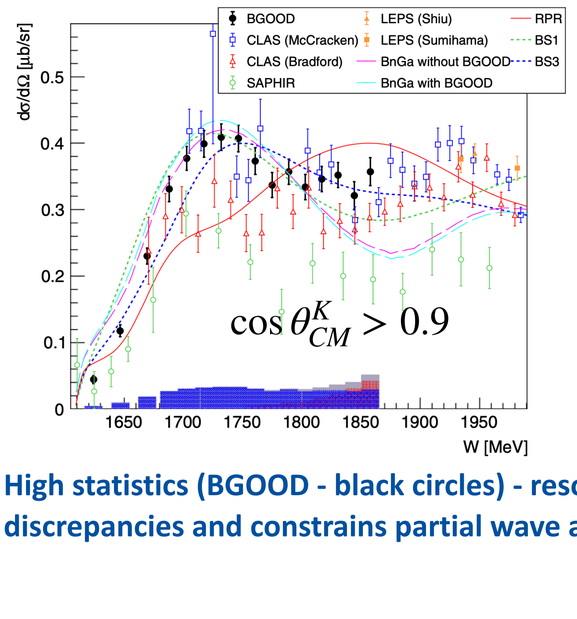


E. Wang, J. Xie, W. Liang, F. Guo, E. Oset, PRC 95 (2017) 015205

Triangle singularity driven by the N*(2030) "pentaquark"?

▪ $K^+\Lambda$ photoproduction

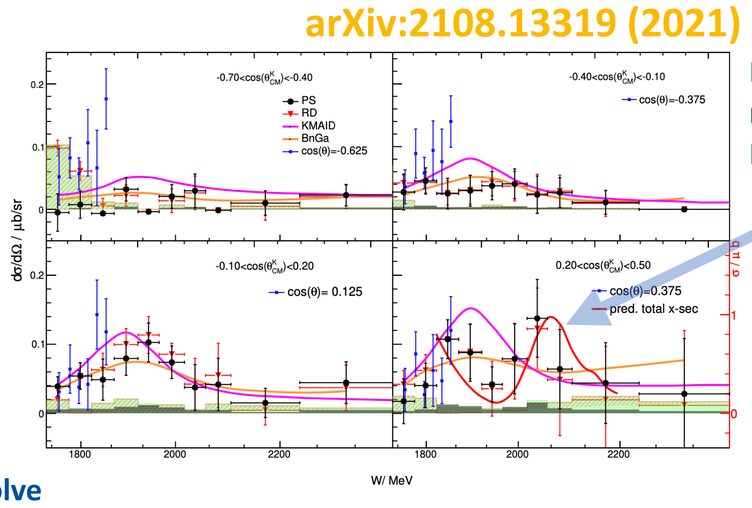
S. Alef et al., EPJA 57 (2021) 80



High statistics (BGOOD - black circles) - resolve discrepancies and constrains partial wave analyses

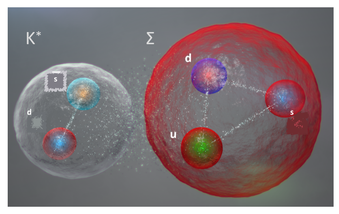
▪ Peak in $K^0\Sigma^0$ photoproduction

K. Kohl, T.C. Jude et al., arXiv:2108.13319 (2021)



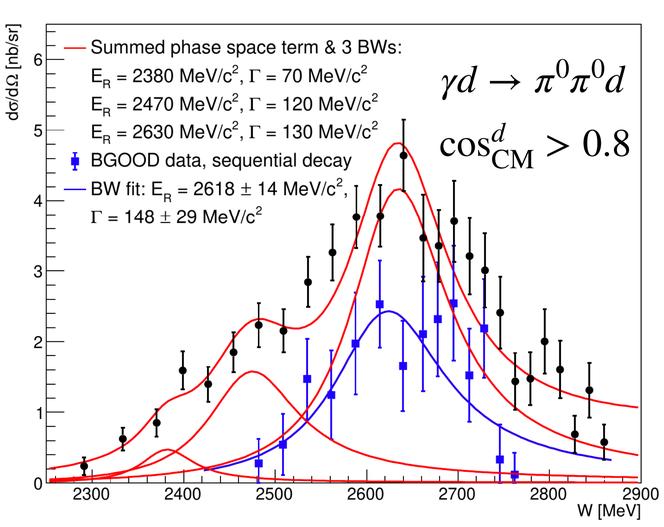
Peak at K* threshold - same model which predicted the LHCb pentaquarks

Oset & Ramos PLB 727 (2013)



▪ Evidence of dibaryons?

T.C. Jude et al., PLB 832 (2022) 137277



Coherent reaction supports proposed dibaryon spectrum

Ishikawa et al, PLB 789 (2019) 413 & PLB 772 (2017) 398

The BGOOD Collaboration Spokespersons - H. Schmieden (Bonn) & P. Levi Sandri (Frascati)

R. Beck[1], A. Braghieri[2], P.L. Cole[3], R. Di Salvo[4], D. Elsner[5], A. Fantini[4,6], A. Figueiredo[5], O. Freyermuth[1], F. Frommberger[1], F. Ghio[7,8], J. Groß[1], T.C. Jude[1], K. Kohl[1], P. Levi Sandri[10], G. Mandaglio[11,12], P. Pedroni[2], M. Romaniuk[5,13], H. Schmieden[1], A. Sonnenschein[5]

[1]Bonn Universität, HISKP, Germany. [2]INFN sezione di Pavia, Italy. [3]Lamar University, Department of Physics, Texas, USA. [4]INFN Roma, Italy. [5]Bonn Universität, PI, Germany. [6]Universitá di Roma, Italy. [7]INFN sezione di Roma La Sapienza, Italy. [8]Istituto Superiore di Sanitá, Rome, Italy. [10]INFN - Laboratori Nazionali di Frascati, Italy. [11]INFN sezione Catania, Italy. [12]Universitá degli Studi di Messina, Italy. [13]Institute for Nuclear Research of NASU,Kyiv, Ukraine.

Poster designed by T.C. Jude

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