Photoproduction of the d*(2380) Dibaryon

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The field of multiquark states (beyond the known meson $q\overline{q}$ and baryon qqq states) has had renewed interest in recent years with findings of potential four, five and six quark states. Recent experiments by the WASA-at-COSY and HADES collaborations have observed a dibaryon (6q) resonant state, the d*(2380). Numerous measurements of this state across a range of different hadronic production channels indicate properties of M = 2380 MeV, Γ = 70 MeV and $I(J^p) = 0(3^+)$. So far no photoproduction channels have been examined.

A new measurement by the A2 collaboration at MAMI aims to observe the d*(2380) from a photoproduction reaction for the first time. A new large acceptance recoil polarimeter measures the final state spin polarisation of nucleons from the D($\vec{\gamma}$,$\vec{n}$p) deuteron photodisintegration reaction. Establishing that the d*(2380) has an electromagnetic coupling opens up opportunities to constrain its size and internal structure. First results from the analysis of the data will be presented.