Search for resonance contributions in electromagnetic production of omega mesons with CLAS at Jefferson Lab

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Quark model calculations [1, 2] indicate that some of the so-called missing baryon resonances at $W > 1.74$ GeV are expected to couple strongly to γN as well as ωN. The ωN channel has not yet been investigated with respect to s-channel contributions due to its low cross section and difficult separation from other production mechanisms which are predominantly diffractive and π-exchange processes when probing with electromagnetic probes.
The CLAS detector at Jefferson Lab has accumulated almost 1 million $p\omega$ events in photo- and electroproduction for the reaction channel $\vec{\gamma}^{(*)}p \to p\pi^+\pi^-\pi^0$ over a large range in the invariant $p\omega$ mass (1.74<W<2.4 GeV) and photon virtuality (Q^2=0; 1<Q^2 <3 GeV^2).
Full angular distributions in the $p\omega$ center-of-mass have been measured. The preliminary differential cross section in the 1.74<W<2.0 GeV range indicate strong deviations from the monotonic t fall of pure t-channel exchange processes, suggesting significant s-channel resonance production. The differential cross section, interference response functions, and angular momenta of the ω decay particles are being analyzed to extract the dominant partial wave contributions. Preliminary results of this analysis will be presented.

References

[1] S. Capstick, Phys. Rev. **D46** (1992) 2864;
[2] S. Capstick and W. Roberts, Phys. Rev. **D49** (1994) 4570.