Study γp->φp channel from g11 data

Update 2/24/2012

Physics Motivation

- Motivation: An upper limit of $\sigma_{\phi N} \simeq 11 mb$ is obtained based on VMD model. However, the extracted total cross section is larger than 30 mb from Spring-8 and JLab. Recent ANKE pA result shows the cross section is between 14 and 21 mb.
- One possible explanation is a possible molecular state of $_{K\bar{K}}$ or $K^+K^- _\phi$.
- the contribution of such state can be studied by requiring a fast-going kaon in the forward angle, then one can compare the reaction between the other kaon and outgoing proton with the available data of Kp scattering.

CLAS Setup



Data Analysis

• Corrections.

➢Energy Loss Correction

➤Momentum Correction

➤Tagger Correction

• Particle Identification.

>K+

➢Proton

Skimming for two tracks: pK⁺



Vertex Cut



Particle Identification



TOF information:

$$\Delta TOF = TOF_{meas} - TOF_{calc}$$

TOF Cuts



|ΔTOF(k+) |< 1 ns | ΔTOF(p) | < 1 ns

Effectiveness of TOF Cuts



Fiducial cut

Missing Mass distributions

K-



$\cos\theta$ distributions



Check Background



-0.5

0.5

-0.5

0.5

Check Events from non- ϕ



Continue...



IM(k+k-)>1.03GeV/c² & IM(k+k-)<1.05GeV/c²

Two tracks: K⁺K⁻



