Survey of the Reaction $\gamma p \rightarrow \omega\eta p$ at GlueX

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Exotic Mesons

QCD allows for J^{PC} combinations forbidden by the quark model. The goal of GlueX is to unambiguously recognize such states. The table shows states allowed to decay to $\omega\eta$.

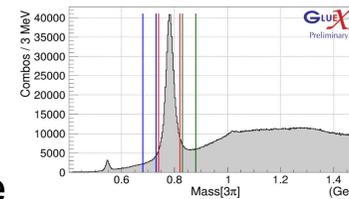| l	J^{PC}
0	1^{+-}
1	$0^{--}, 1^{--}, 2^{--}$
2	$1^{+-}, 2^{+-}, 3^{+-}$
3	$2^{--}, 3^{--}, 4^{--}$

Event Selection

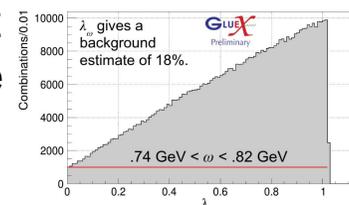We present the whole GlueX Phase I data set. We applied selection cuts to ensure exclusive events.
An important selection was the $2\pi^0$ veto.
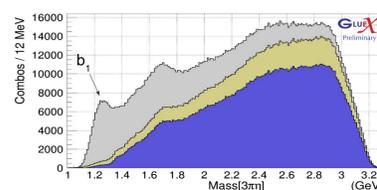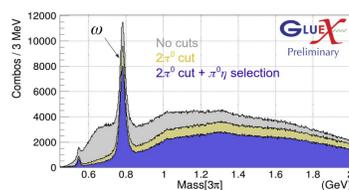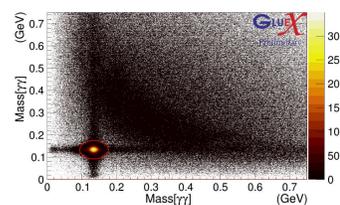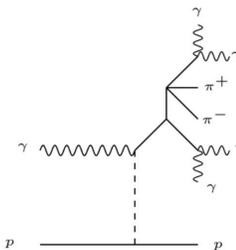
We selected ω events. The λ distribution allowed us to approximate the background in the selection. Given the vector nature of ω, events coming from it will linearly rise, while the background will be flat.
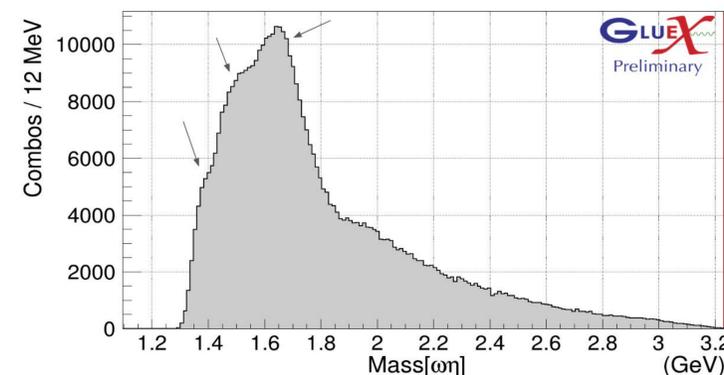

$$\lambda = \frac{\left|\vec{\pi}^+ \times \vec{\pi}^-\right|^2}{\frac{3}{4}\left(\frac{1}{9}M_{3\pi}^2 - M_\pi^2\right)^2}$$

λ_ω gives a background estimate of 18%.
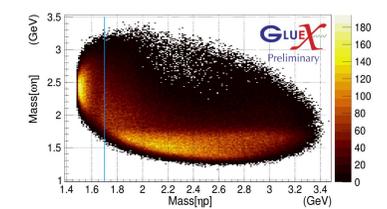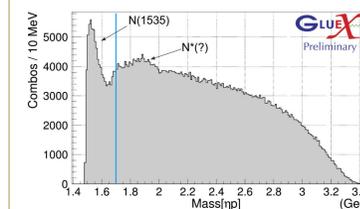
.74 GeV < ω < .82 GeV

Results for $\omega\eta$ Selection

About 485k events survive our selections. These events concentrate in a region known to contain the mesons $\omega(1420)$, $h_1(1595)$, and $\omega(1650)$.

Baryon Contamination

Our sample contains N* background processes. While some of them, like the N(1535), can be removed with a mass cut, others require future studies.

Summary

- Approximately 485k $\omega\eta$ events from the GlueX Phase I data set
- Work is in process to study N* background
- Future work will consist of a Partial Wave Analysis

Acknowledgements