A Study of the $\eta\eta\pi^-$ and $\omega\eta\pi^-$ Systems Produced in the Reaction $\pi^-p\to\pi^+\pi^-\pi^-4\gamma p$ at 18 GeV/*c*

Presented by
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for the Brookhaven E852 Collaboration

Overview

- BNL–E852 Apparatus & the Data
- Features of the $\pi^+\pi^-\pi^-\pi^0\eta$ System
- $\eta\eta\pi^-$ Mass Spectrum Analysis
- $\omega\eta\pi^-$ Mass Spectrum Analysis
- Summary and Future prospects

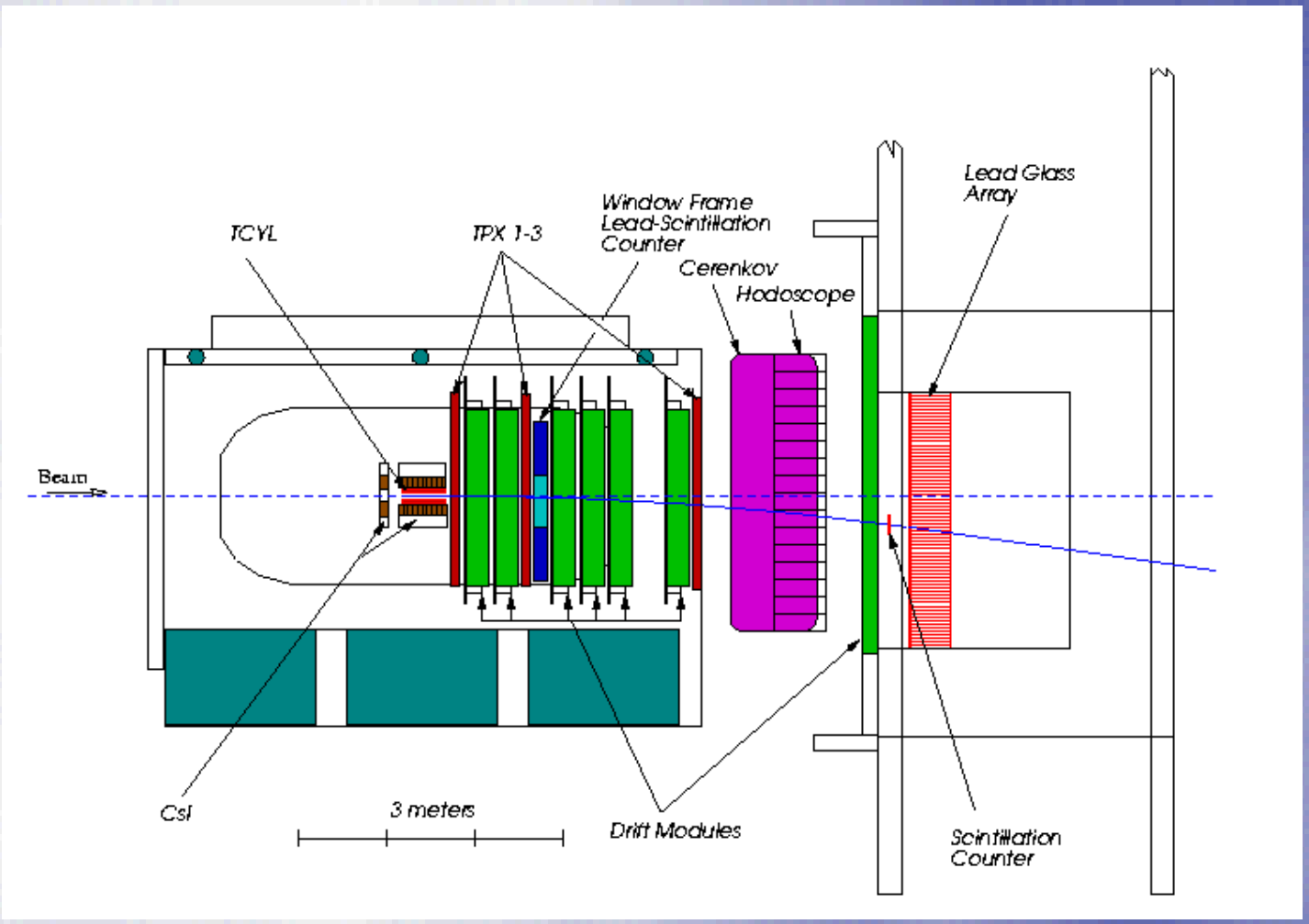
The E852 Collaboration

- Brookhaven
- Carnegie Mellon
- Indiana
- IHEP Protvino
- Jefferson Lab
- Moscow State
- Notre Dame
- Northwestern
- Rensselaer
- Umass–Dartmouth

Data & Cuts

- Data from the 1995 Brookhaven E852 Run
- 265 Million Triggers of this type
- Events reconstructed with:
  - 4 photons
  - 3 forward tracks with vertex at the beam
  - consistent recoil track
  - CsI Barrel rejection
  - Fiducial volume (target & LGD)
  - DEA rejection
  - Hadron tagging at the LGD

E852 Plan View



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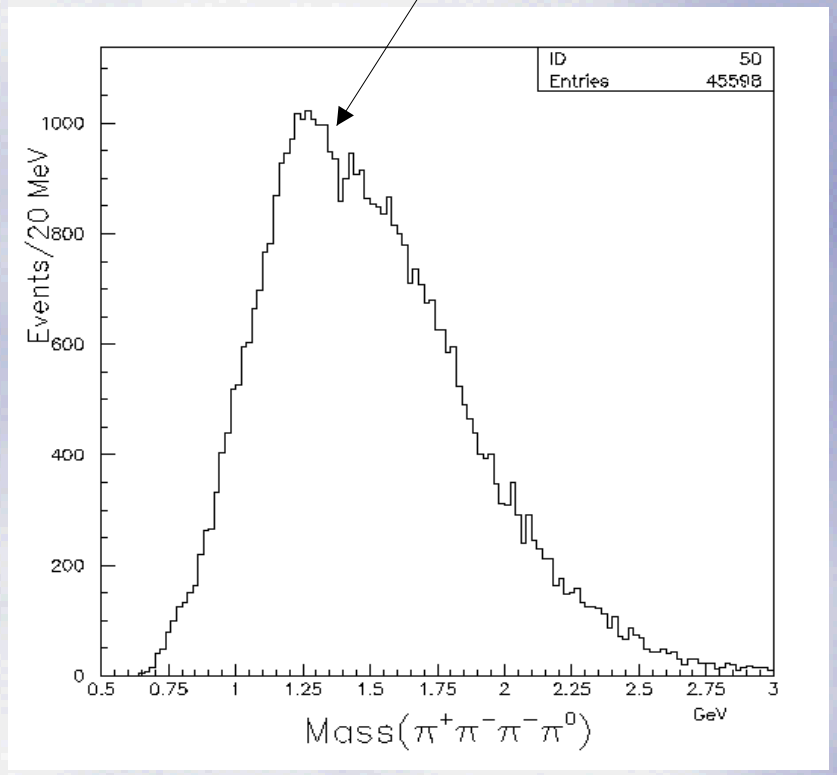
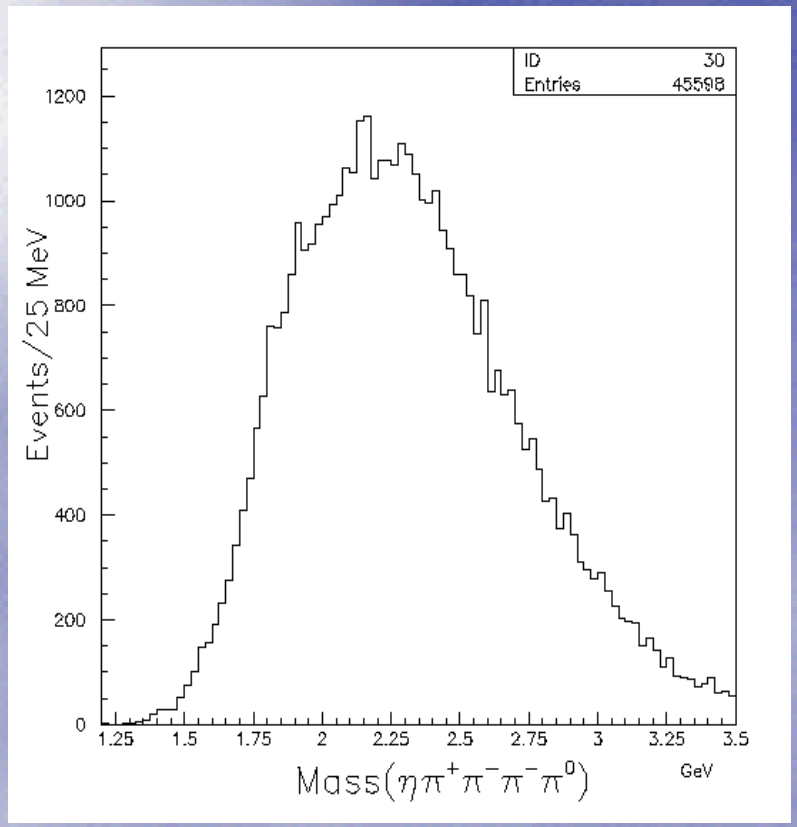
Features of the $\pi^+\pi^-\pi^-\pi^0\eta$ System

?

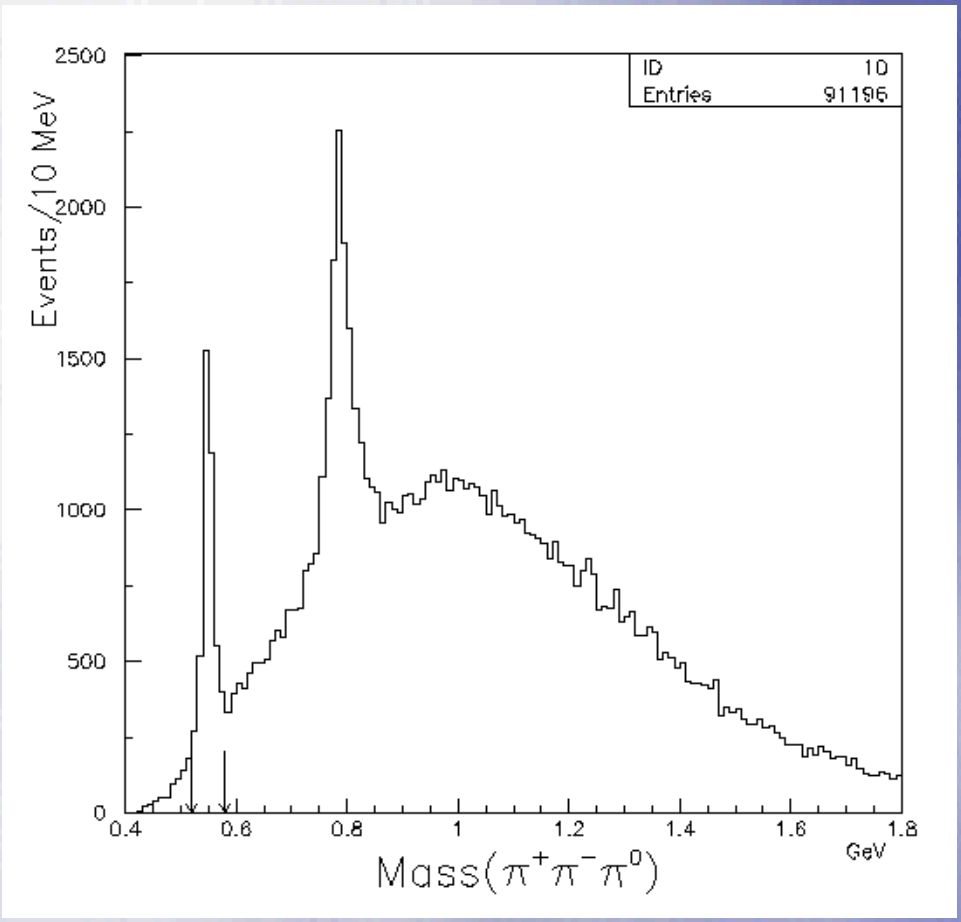
$b_1(1235)$

?





$\eta\eta\pi^-$ Final State



- 45600 kinematically fitted $\pi^-p \rightarrow \pi^+\pi^-\pi^-\pi^0\eta p$ events
- 5000 selected $\eta\eta\pi^-$ events

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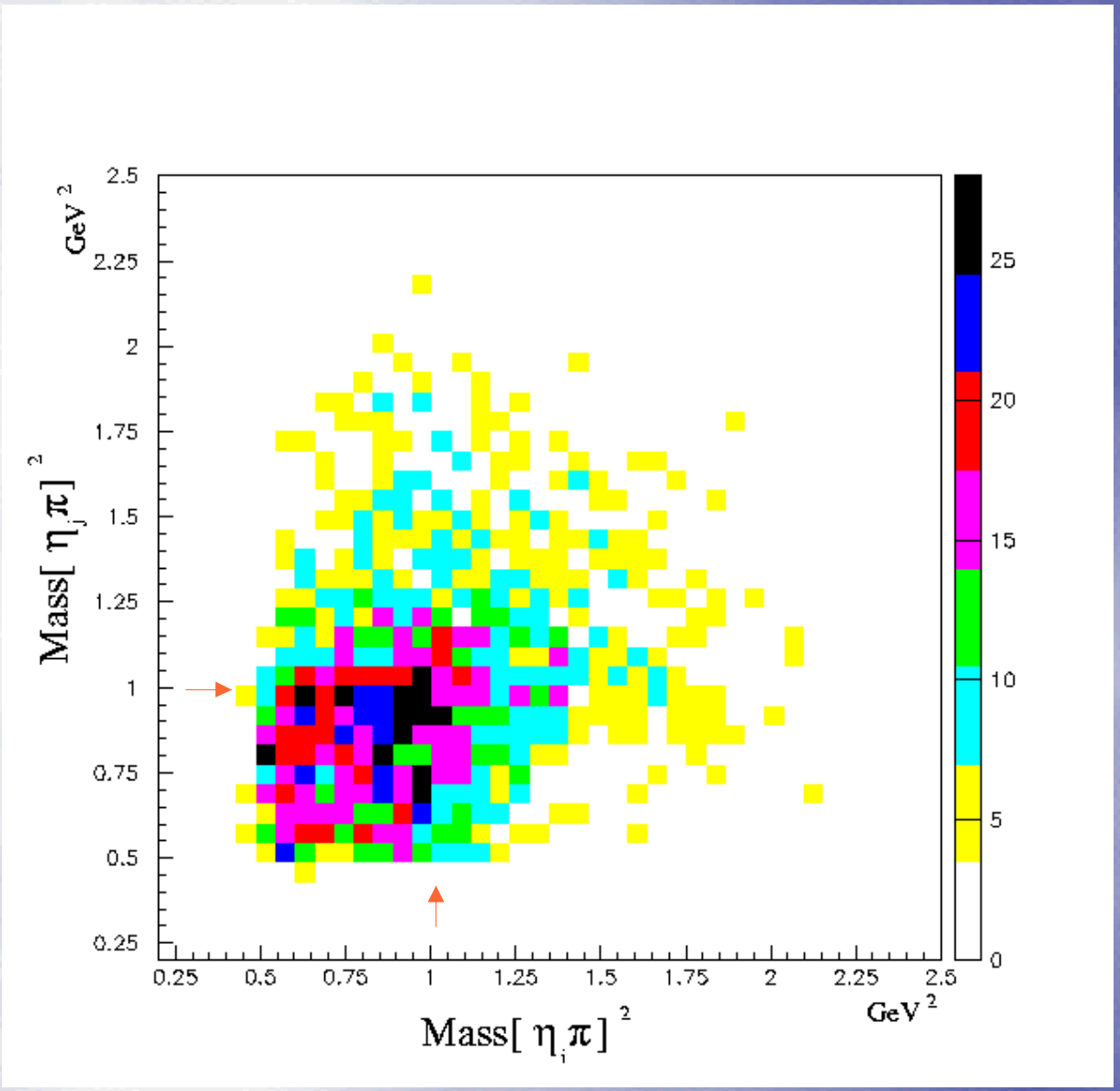
$\eta\eta\pi^-$ Dalitz Plot



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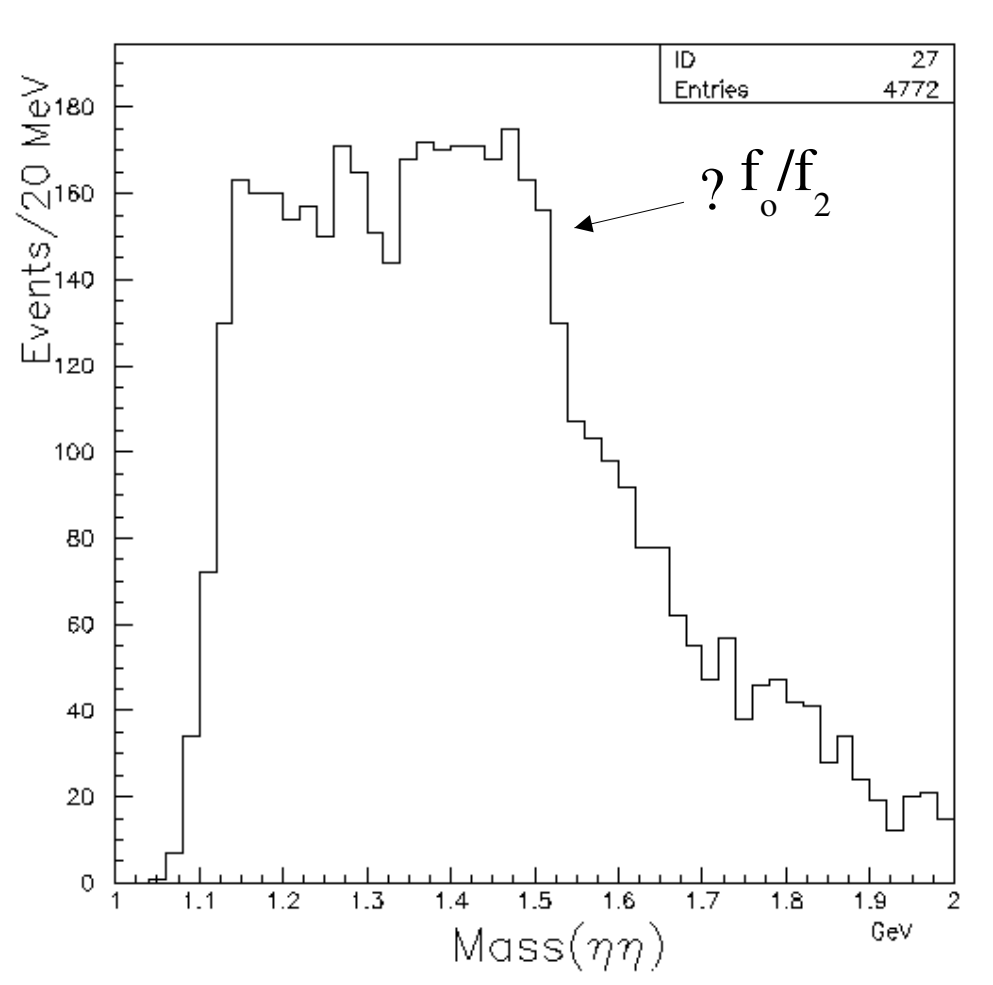
ηη Effective Mass



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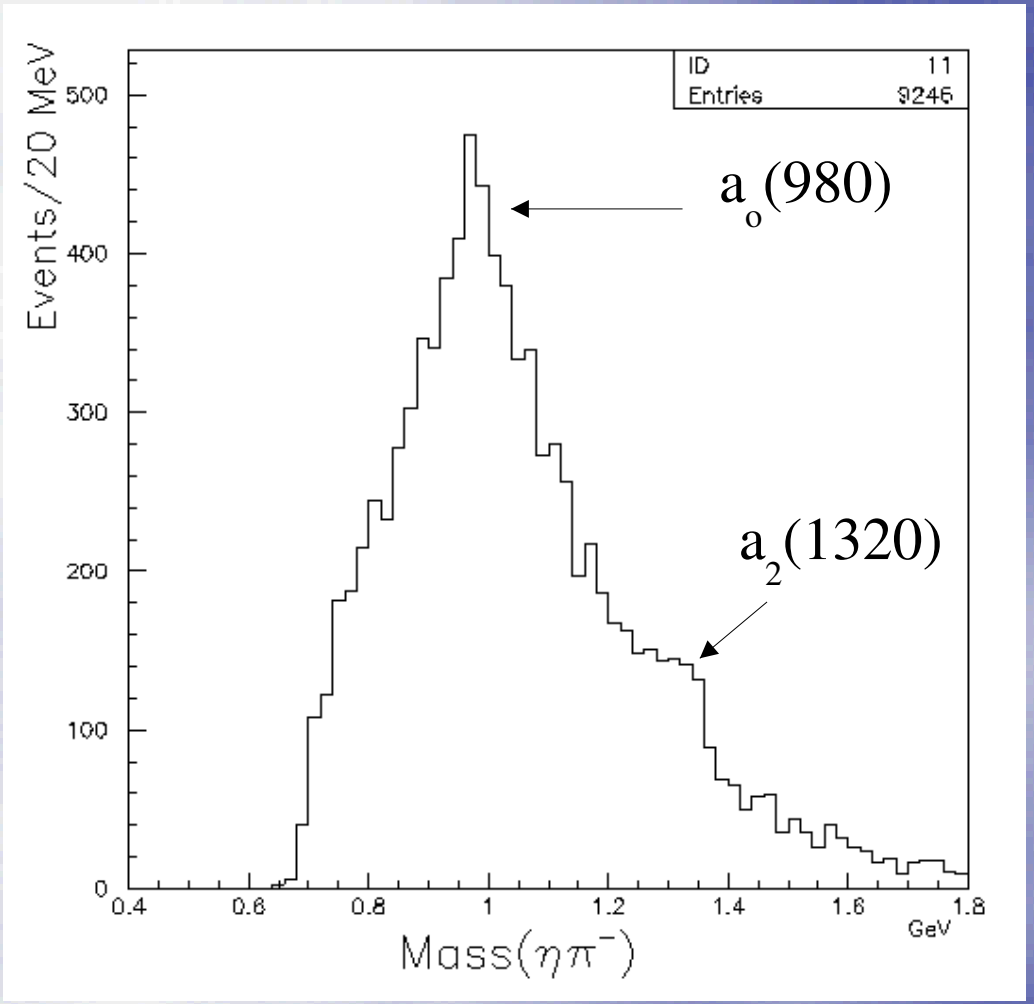
$\eta\pi^-$ Effective Mass



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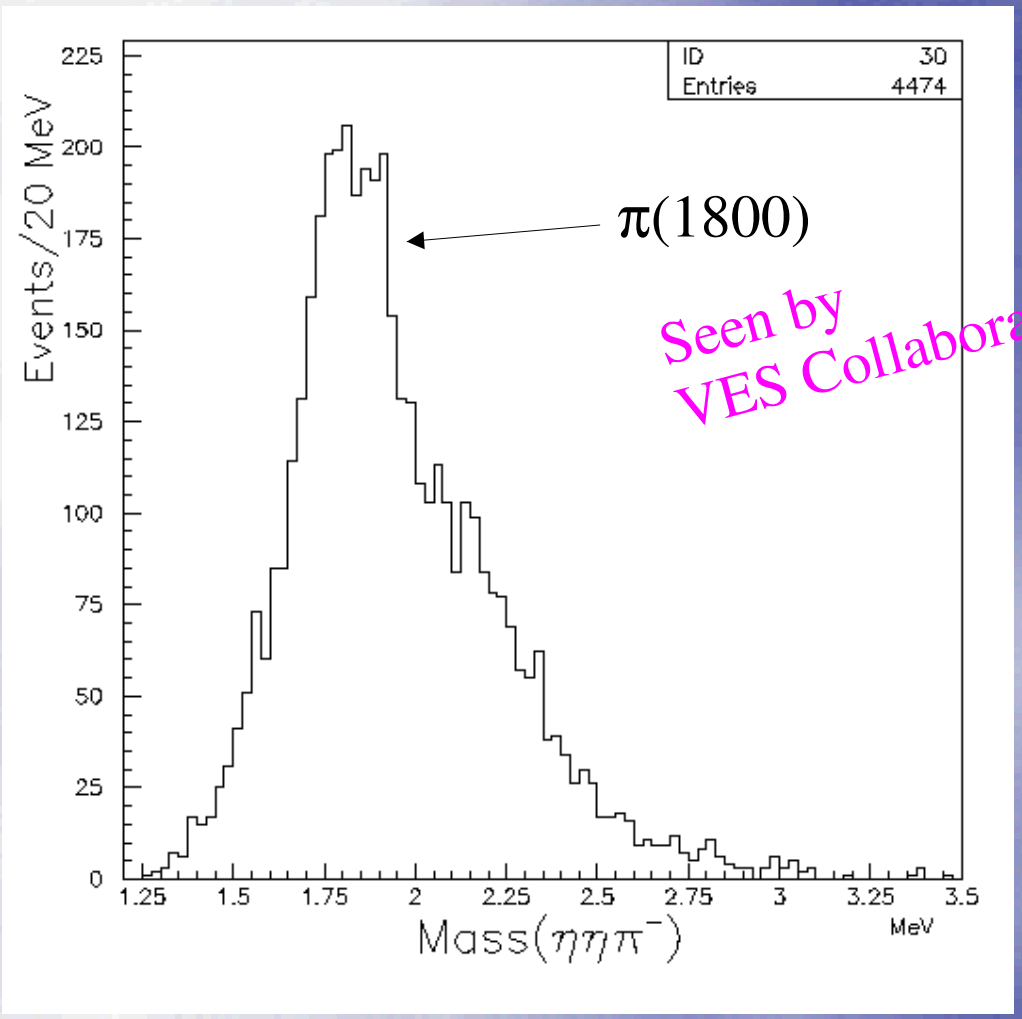
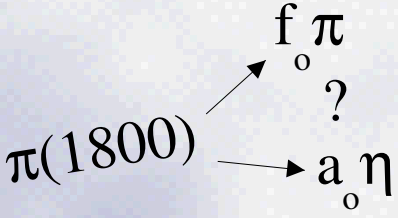
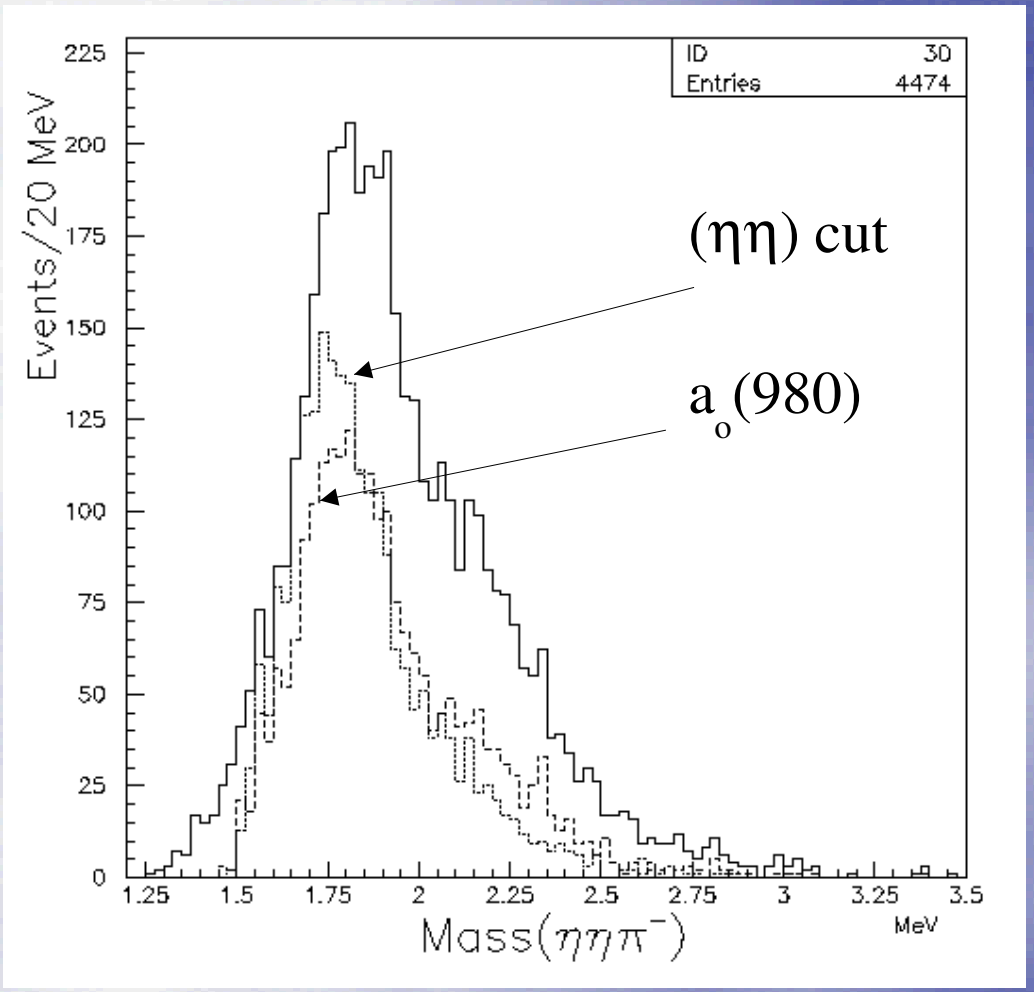
$\eta\eta\pi^-$ Effective Mass



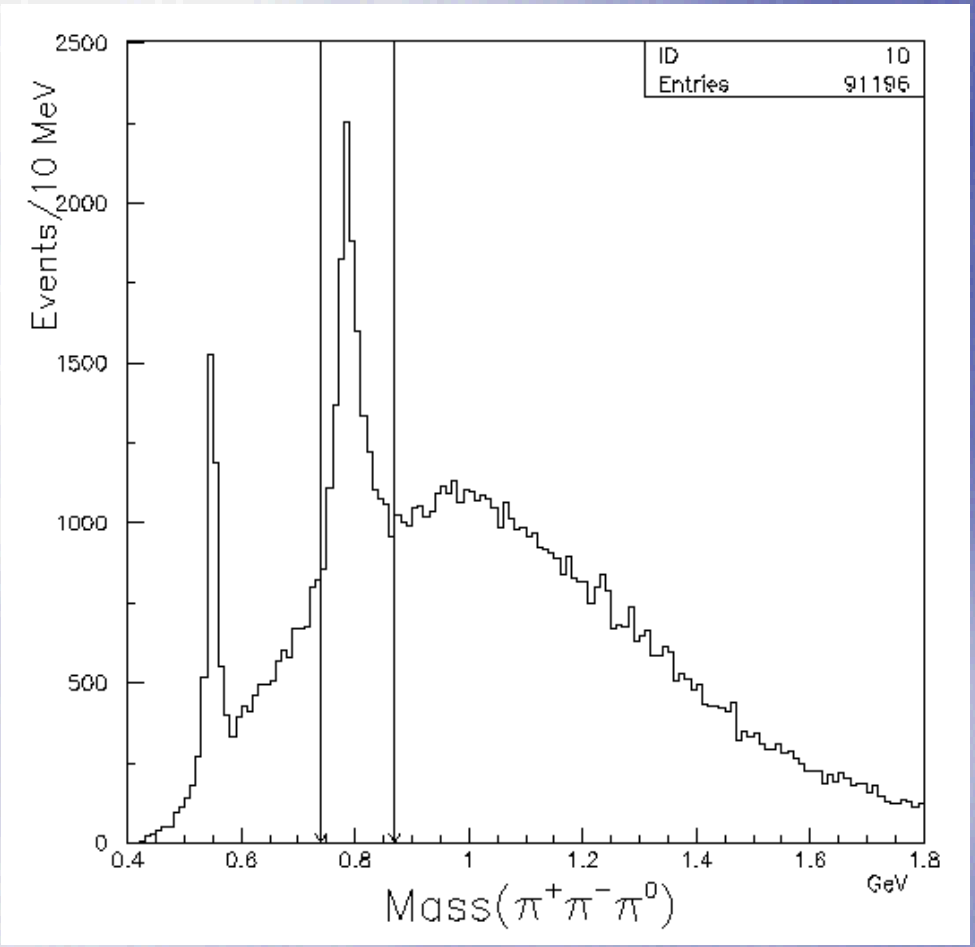
Seen by
VES Collaboration

$a_0\eta$ and/or $(f_0/f_2)\eta$ isobar decays

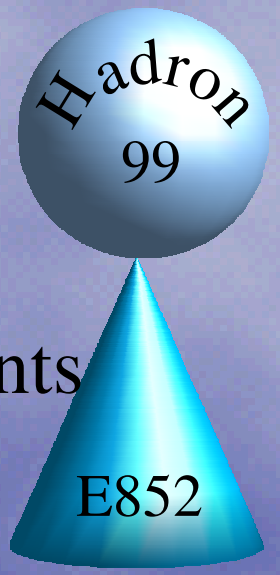




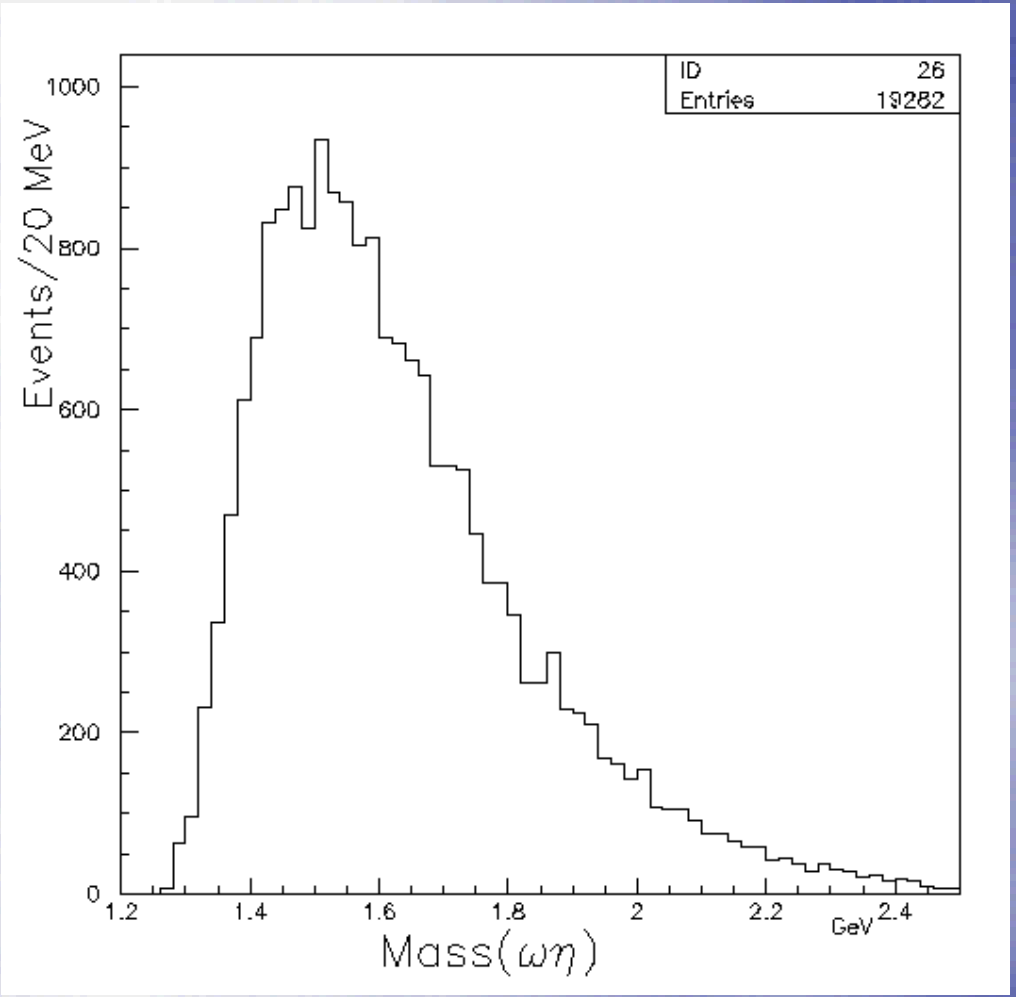
$\omega\eta\pi^-$ Final State



- 45600 kinematically fitted $\pi^-p \rightarrow \pi^+\pi^-\pi^-\pi^0\eta p$ events
- 16400 selected $\omega\eta\pi^-$ events



ωη Effective Mass



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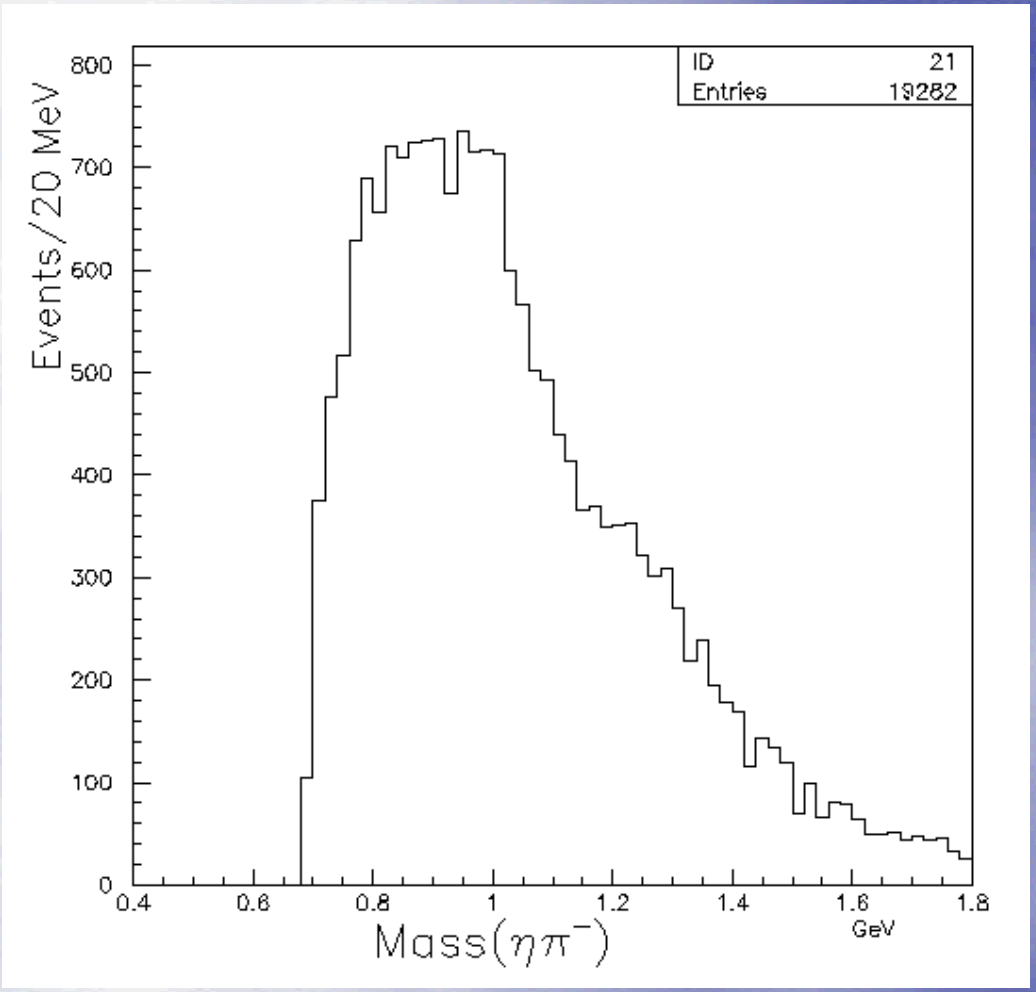
$\eta\pi^-$ Effective Mass



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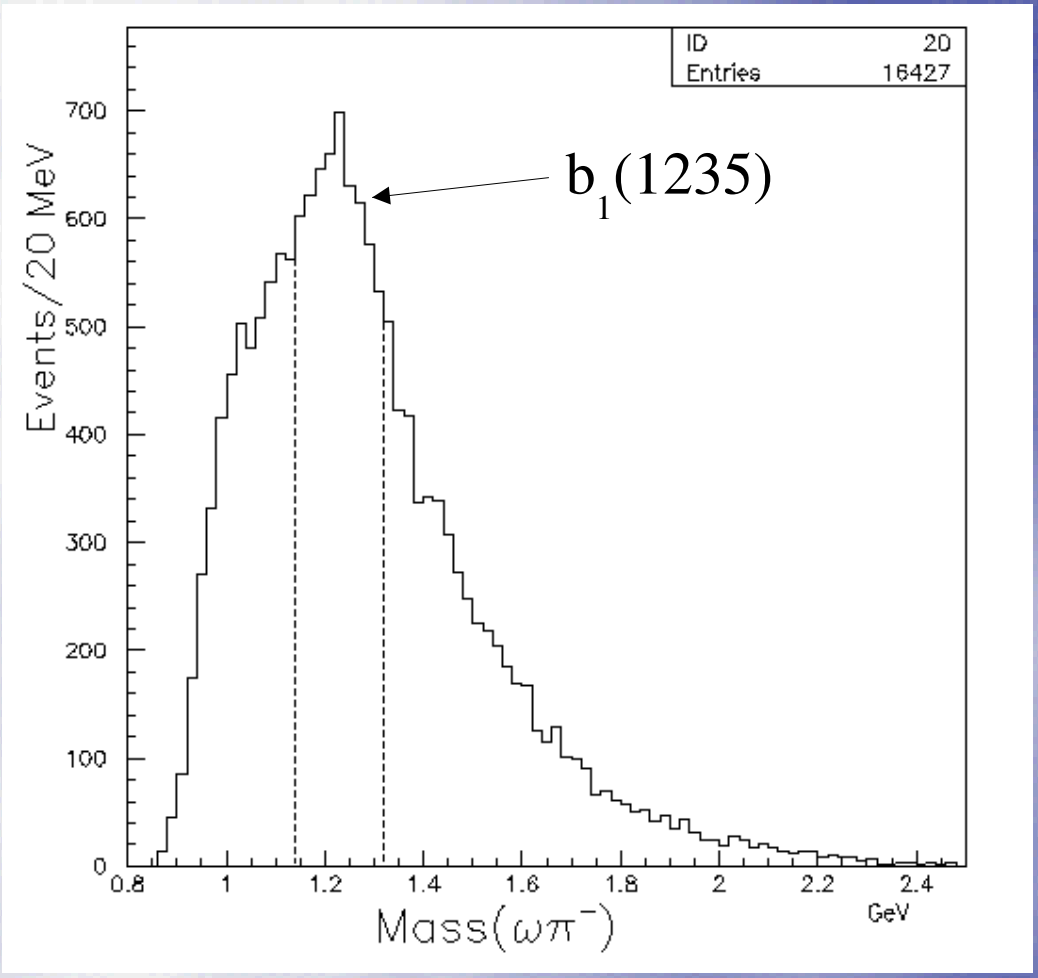
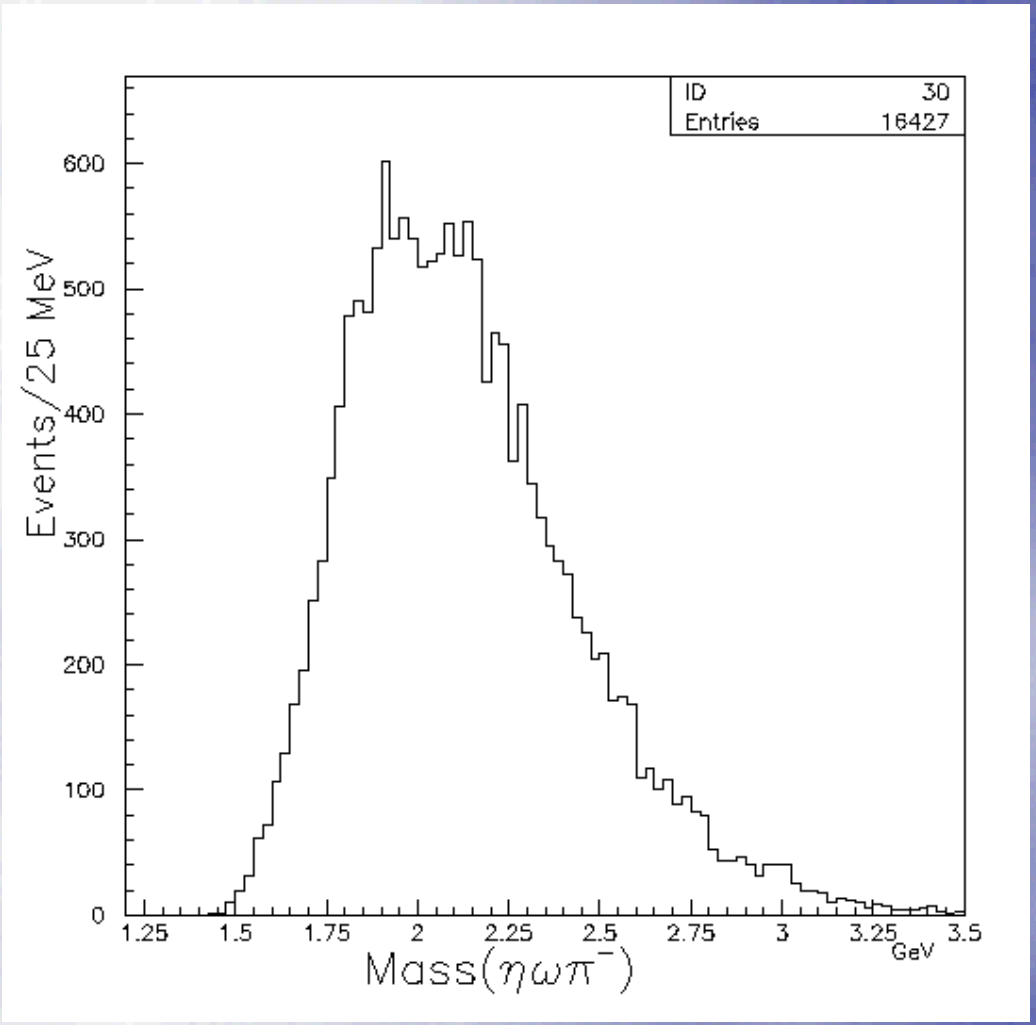
$\omega\pi^-$ Effective Mass



$\omega\eta\pi^-$ Effective Mass



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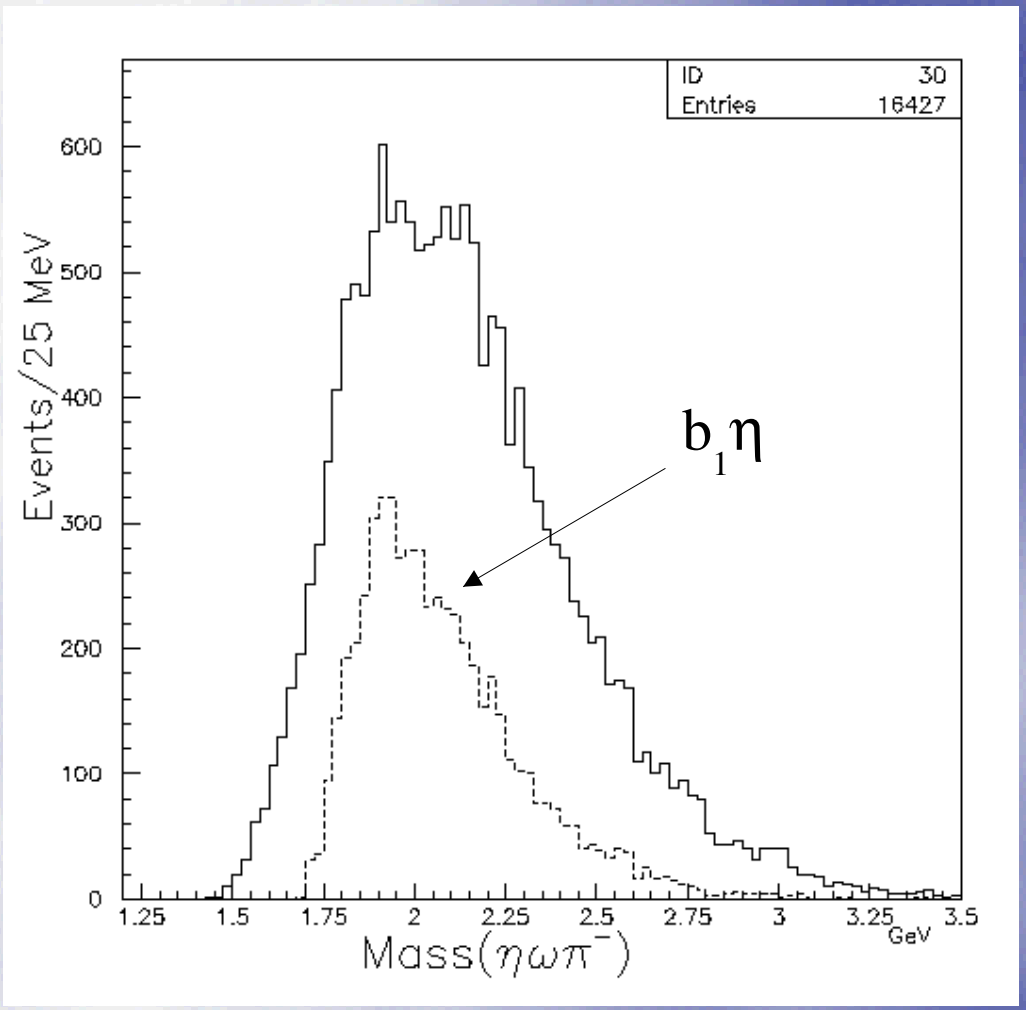
$b_1\eta$ isobar decay



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Next Steps

Partial Wave Analysis