

年度工作总结

(2023.12-2024.11)

杨洪勋

岗位职责：

- 物理分析
- 文章发表
- 经费争取
- 研究生指导
- 公共服务

本年度工作情况：

$\psi' \rightarrow K^- \Lambda \bar{\Xi}^+ + c.c.$ 的分波分析研究 与王宗源合作

PRD 109, 072008 (2024)

BAM-00395: Study of Ξ^* in decay $\Psi' \rightarrow K^- \Lambda \bar{\Xi}^+ + c.c.$

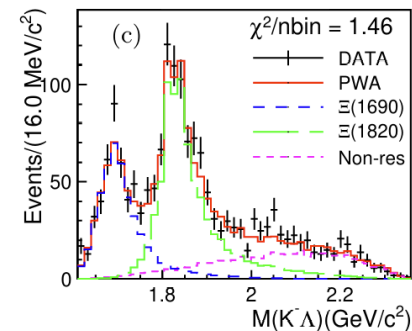
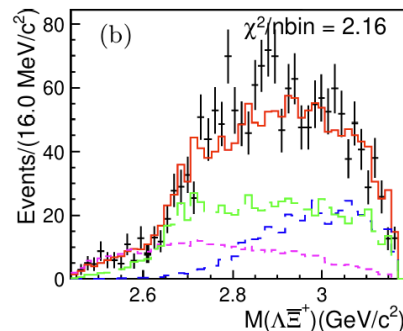
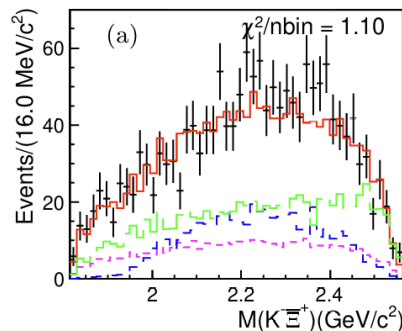
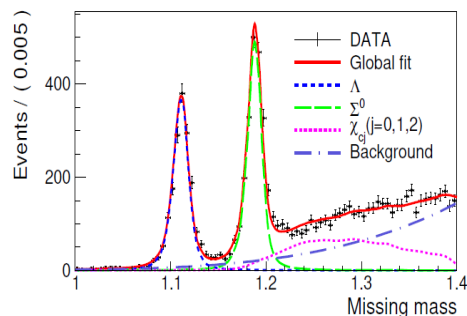


TABLE V. Systematic uncertainties on the measurements of the $\bar{\Xi}^+$ parameters and branching fractions.

Source	$\Xi(1690)$			$\Xi(1820)$		
	$\Delta M(\text{MeV}/c^2)$	$\Delta \Gamma(\text{MeV})$	$\Delta \mathcal{B}/\mathcal{B}(\%)$	$\Delta M(\text{MeV}/c^2)$	$\Delta \Gamma(\text{MeV})$	$\Delta \mathcal{B}/\mathcal{B}(\%)$
Number of $\psi(3686)$ events	-	-	0.7	-	-	0.7
MDC tracking of K^\pm	-	-	1	-	-	1
PID of K^\pm	-	-	1	-	-	1
$\bar{\Xi}^+$ reconstruction	-	-	6.6	-	-	6.6
Background level	0	3	1.0	1	1	0.9
Background sideband	0	4	0.4	0	1	1.4
Non-res component	11	9	11.3	2	3	15.6
Additional resonances	5	17	14.0	2	2	3.7
Different form factors	0	2	3.0	1	8	1.3
Fit bias	1	3	8.4	0	1	2.4
Resonance parameters of $\Xi(1690)$ and $\Xi(1820)$	-	-	19.8	-	-	3.2
Total	12	20	29.1	3	9	18.1

TABLE VI. $I(J^P)$, mass and width for each component (The first is statistical, the second is systematic)

Resonance	$I(J^P)$	Mass(MeV/c^2)	Width(MeV/c^2)
$\Xi(1690)$	$1/2(1/2^-)$	$1685_{-2}^{+3} \pm 12$	$81_{-9}^{+10} \pm 20$
$\Xi(1820)$	$1/2(3/2^-)$	$1821_{-3}^{+2} \pm 3$	$73_{-5}^{+6} \pm 9$

TABLE VII. Branching fraction results; the first (second) uncertainty is statistical (systematic).

Resonance	Branching fraction
$\mathcal{B}(\psi(3686) \rightarrow \Xi(1690)^- \bar{\Xi}^+ + c.c.) \times \mathcal{B}(\Xi(1690)^- \rightarrow K^- \Lambda)$	$(1.06 \pm 0.10 \pm 0.31) \times 10^{-5}$
$\mathcal{B}(\psi(3686) \rightarrow \Xi(1820)^- \bar{\Xi}^+ + c.c.) \times \mathcal{B}(\Xi(1820)^- \rightarrow K^- \Lambda)$	$(1.78 \pm 0.10 \pm 0.32) \times 10^{-5}$
$\psi(3686) \rightarrow K^- \Lambda \bar{\Xi}^+ + c.c.$	$(3.60 \pm 0.10 \pm 0.24) \times 10^{-5}$

本年度工作情况：

PWA of $J/\psi \rightarrow K \Sigma^0 \bar{\Xi}^+ + c.c.$

BAM-00781

- $J/\psi \rightarrow K \Sigma^0 \bar{\Xi}^+ + c.c.$ is observed and analyzed the first time based on 10 billion J/ψ events collected by the BESIII detector at BEPCII. Significant **excited states** are observed.
- PWA is performed to study the excited hyperon states. The mass, width, spin-parity and production of $\Xi(1690)$ are measured.
- A candidate **new excited state, $\Xi(1720)$** is observed significantly at $\sim 1720 \text{ MeV}/c^2$ in the invariant mass spectrum of $K \Sigma^0$ in $J/\psi \rightarrow K \Sigma^0 \bar{\Xi}^+ + c.c.$ decay.

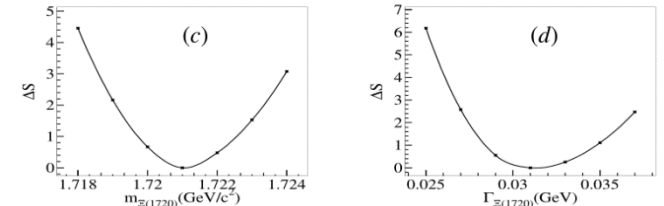
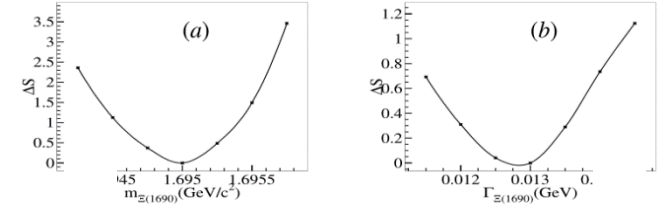
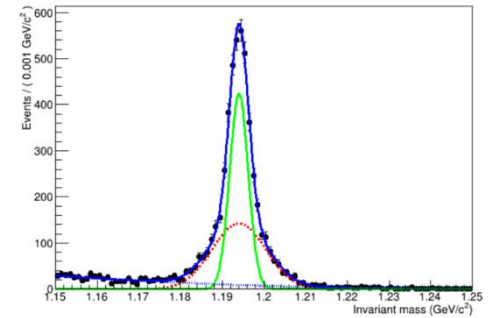
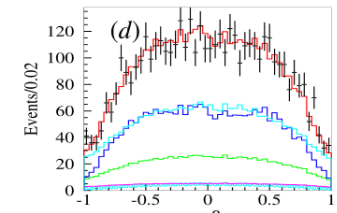
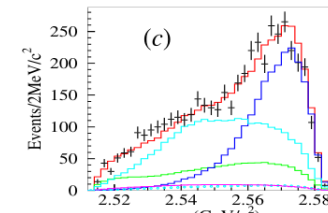
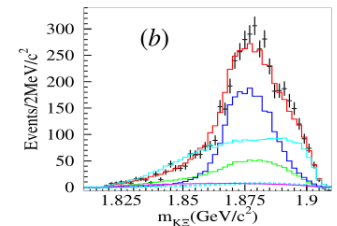
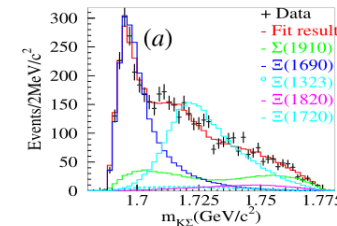


Table 14: Uncertainties

ΔS	$\frac{1}{2}^-$	$\frac{1}{2}^+$	$\frac{3}{2}^-$	$\frac{3}{2}^+$
$\Xi(1690)$	-	76	333	85
$\Xi(1720)$	59	57	71	-

sources	$m_{\Xi(1690)}$ (MeV/ c^2)	$\Gamma_{\Xi(1690)}$ (MeV)	$m_{\Xi(1720)}$ (MeV/ c^2)	$\Gamma_{\Xi(1720)}$ (MeV)	$Br_{\Xi(1690)}$ (%)	$Br_{\Xi(1720)}$ (%)	$Br_{K\Sigma\Xi}$ (%)
tracking	-	-	-	-	1.0	1.0	1.0
PID	-	-	-	-	1.0	1.0	1.0
Ξ rec.	-	-	-	-	5.0	5.0	5.0
1D fit	-	-	-	-	3.1	3.0	3.1
$Br(\Lambda \rightarrow p\pi^-)$	-	-	-	-	0.8	0.8	0.8
$N_{J/\psi}$	-	-	-	-	0.5	0.5	0.5
PWA bias	0.1	0.3	1.5	8.5	4.69	13.4	-
background	1.2	3.5	2.0	2.6	19.6	41.9	-
other states	0.5	7.5	2.3	11.0	35.2	64.1	-
Γ_s	0.6	0.5	1.4	4.6	3.3	8.9	-
form factor	0.2	0.5	1.3	4.6	1.2	12.3	-
Total	1.5	8.3	3.9	15.6	41.2	79.5	6.2



process	spin-parity	Mass(MeV/ c^2)	Width(MeV)	Branching fraction($\times 10^{-5}$)
$\Xi(1690)$	$\frac{1}{2}^-$	$1695.0 \pm 0.9 \pm 1.5$	$12.8 \pm 1.8 \pm 8.3$	$1.86 \pm 0.54 \pm 0.77$
$\Xi(1720)$	$\frac{3}{2}^+$	$1721.0 \pm 5.2 \pm 3.9$	$31.3 \pm 18.3 \pm 15.6$	$1.22 \pm 0.42 \pm 0.97$
$K\Sigma\Xi$	-	-	-	$2.68 \pm 0.04 \pm 0.16$

本年度工作情况

PWA of $J/\psi \rightarrow K^- \Lambda \bar{\Xi}^+ + c.c.$

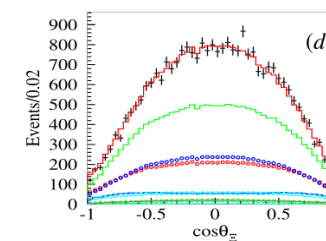
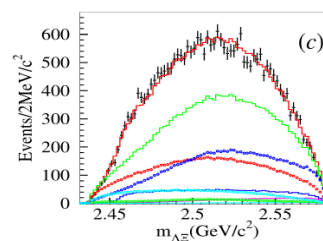
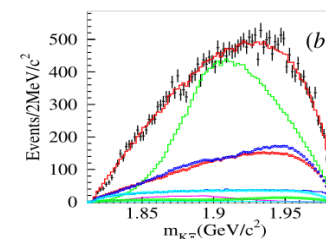
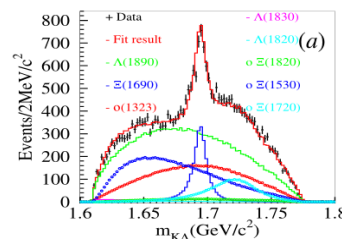
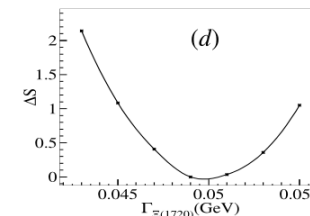
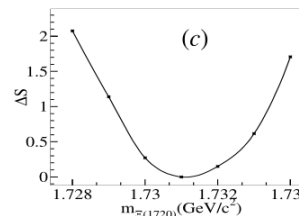
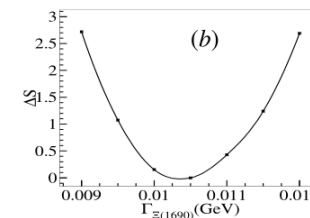
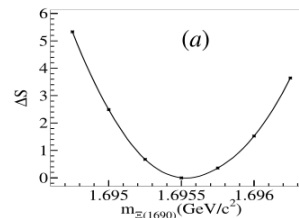
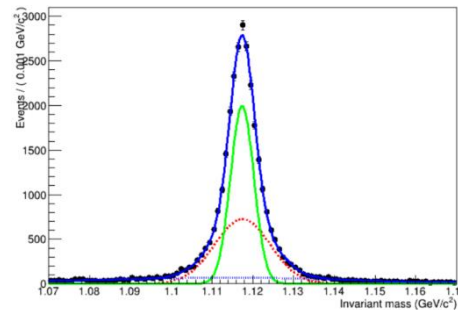
BAM-00781

- $\Xi(1690)$ is measured precisely.
- new state, $\Xi(1720)$, is confirmed.
- Observation of $\Xi(1530)$ coupling to $K\Lambda$.

ΔS	$\frac{1}{2}^-$	$\frac{1}{2}^+$	$\frac{3}{2}^-$	$\frac{3}{2}^+$
$\Xi(1690)$	-	81	62	54
$\Xi(1720)$	166	32	44	-

Table 27: Uncertainties in $J/\psi \rightarrow K^- \Lambda \bar{\Xi}^+ + c.c.$

sources	$m_{\Xi(1690)}$ (MeV/c ²)	$\Gamma_{\Xi(1690)}$ (MeV)	$m_{\Xi(1720)}$ (MeV/c ²)	$\Gamma_{\Xi(1720)}$ (MeV)	$Br_{\Xi(1690)}$ (%)	$Br_{\Xi(1720)}$ (%)	$Br_{\Xi(1530)}$ (%)	$Br_{K\Lambda\Xi}$
tracking	-	-	-	-	1.0	1.0	1.0	1.0
PID	-	-	-	-	1.0	1.0	1.0	1.0
Ξ rec.	-	-	-	-	5.0	5.0	5.0	5.0
1D fit	-	-	-	-	3.1	3.2	3.1	3.1
$Br(\Lambda \rightarrow p\pi^-)$	-	-	-	-	0.8	0.8	0.8	0.8
$N_{J/\psi}$	-	-	-	-	0.5	0.5	0.5	0.5
PWA bias	0.1	0.2	0.1	1.8	3.4	4.2	1.5	-
background	0.2	0.3	3.5	2.7	10.7	24.7	6.2	-
other states	0.4	0.7	3.1	6.5	15.0	45.7	37.8	-
$\Gamma(s)$	0.4	0.3	2.9	3.9	2.5	6.2	5.1	-
form factor	0.2	0.4	0.7	2.3	2.3	16.7	5.7	-
Total	0.7	1.0	5.6	8.6	20.0	55.5	39.6	6.2



process	spin-parity	Mass(MeV/c ²)	Width(MeV)	Branching fraction($\times 10^{-5}$)
$\Xi(1690)$	$\frac{1}{2}^-$	$1695.5 \pm 0.4 \pm 0.7$	$10.3 \pm 0.9 \pm 1.0$	$0.50 \pm 0.08 \pm 0.10$
$\Xi(1720)$	$\frac{3}{2}^+$	$1731.1 \pm 2.7 \pm 5.6$	$49.7 \pm 6.3 \pm 8.6$	$0.55 \pm 0.16 \pm 0.31$
$\Xi(1530)$	$\frac{3}{2}^+$	-	-	$1.58 \pm 0.33 \pm 0.63$
$K\Lambda\Xi$	-	-	-	$5.56 \pm 0.04 \pm 0.35$

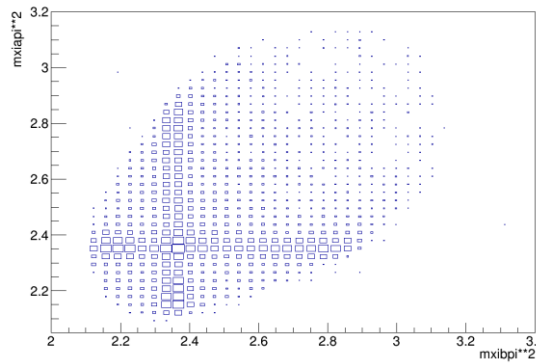
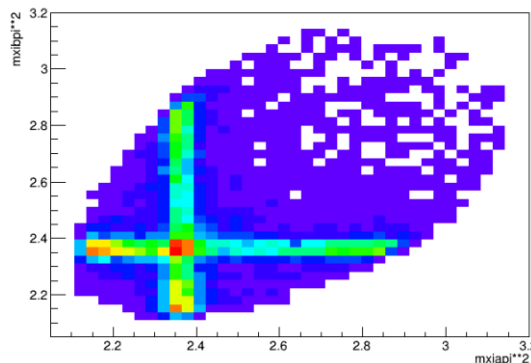
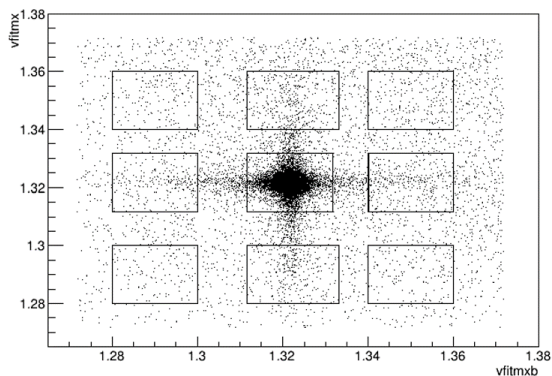
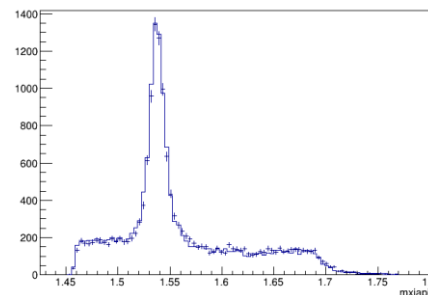
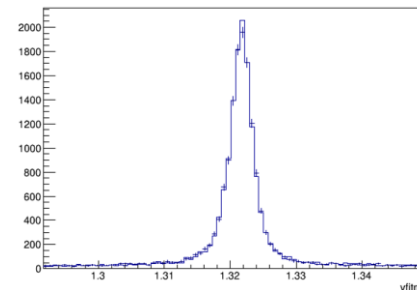
本年度工作情况：

Partial Wave Analysis of $J/\psi \rightarrow \Xi^- \bar{\Xi}^+ \pi^0$

- $\Xi(1530)$ 是简单的一个共振态吗?
 - Unquenched quark models 预言了 $J^P = \frac{1}{2}^-$ 的 Ξ^* 质量在 1.55 GeV 附近，需要实验数据的检验
- $\Xi(1620)$ 是否存在?
- 如何理解SU(3) 破坏过程 $J/\psi \rightarrow \Xi(1530) \bar{\Xi}$?

$$\begin{aligned} \Gamma_{147} \quad \Xi(1530)^- \bar{\Xi}^+ + \text{c.c.} & \quad (3.18 \pm 0.08) \times 10^{-4} \\ \Gamma_{148} \quad \Xi(1530)^0 \bar{\Xi}^0 & \quad (3.2 \pm 1.4) \times 10^{-4} \end{aligned}$$

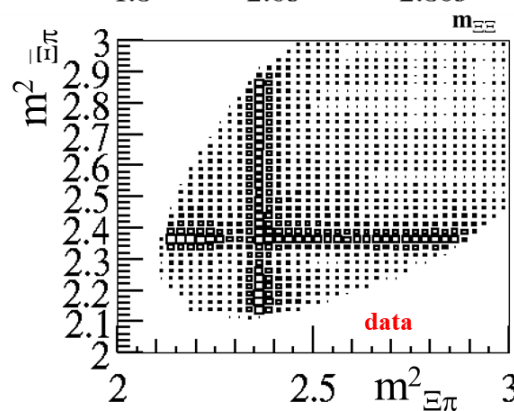
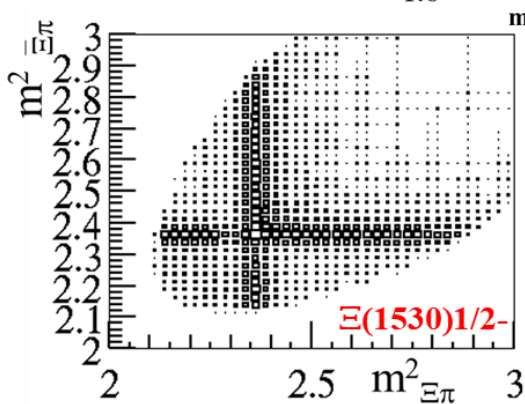
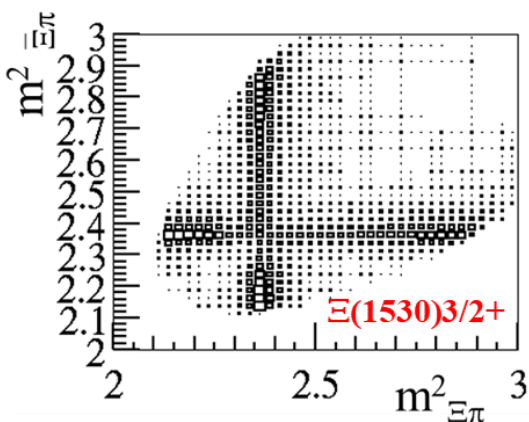
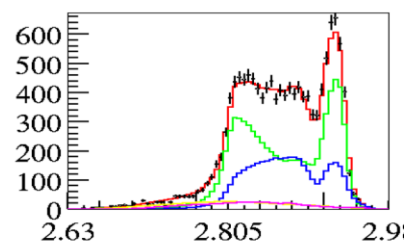
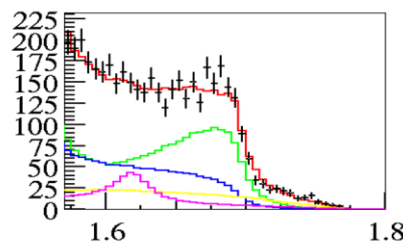
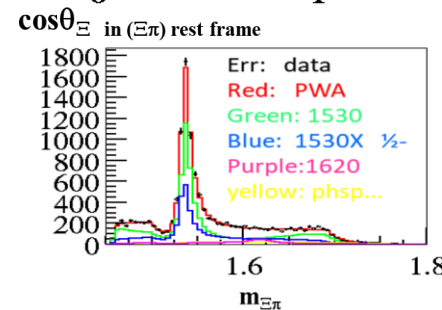
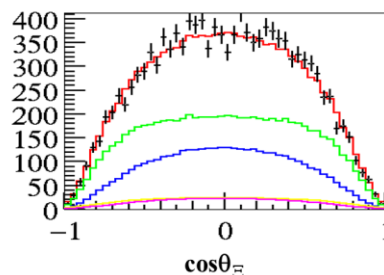
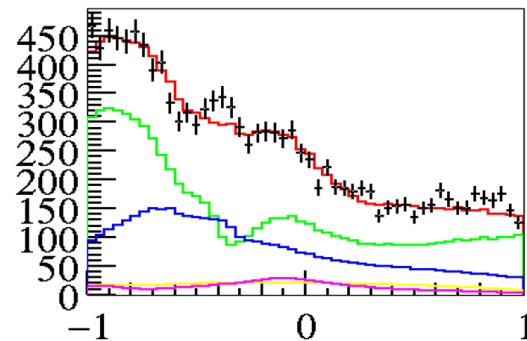
- 解释 $\Xi(1530)$ 耦合到 $K\Lambda$ 的可能?
- 研究 $\Xi(1690)$ 耦合到 $\Xi\pi$ 的强度
- $J/\psi \rightarrow \Xi^- \bar{\Xi}^+ \pi^0$ 的分波分析将有助于解决上述问题.



本年度工作情况：

PWA of $J/\psi \rightarrow \Xi - \bar{\Xi}^+ \pi^0$

- $\Xi(1530)$ 是简单的一个共振态吗？
 - 质量谱、角分布和dalitz图都支持1/2-成分的存在。初步分波分析显著性很高。
- $\Xi(1620)$ 是否存在？
 - 质量谱和dalitz图上没有显著的 $\Xi(1620)$. 但在初步分波分析中有一定的显著性
- 如何理解SU(3)破坏过程 $J/\psi \rightarrow \Xi(1530) \bar{\Xi}$ ？
 - 1/2-成分贡献？
- 研究 $\Xi(1690)$ 耦合到 $\Xi\pi$ 的强度
 - 没有显著的信号，初步分波分析中不超过1%,说明 $\Xi(1690)$ 耦合到 $\Xi\pi$ 的强度很弱。

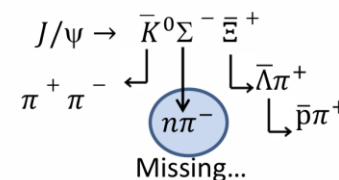


本年度工作情况

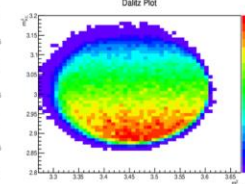
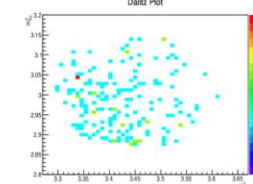
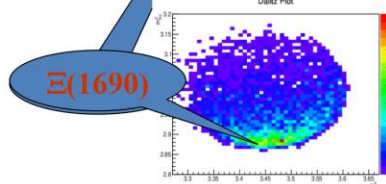
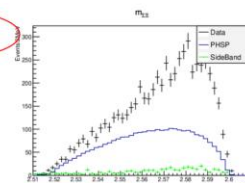
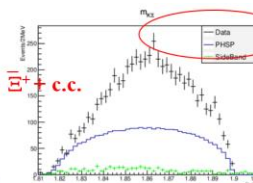
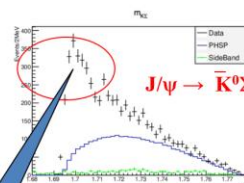
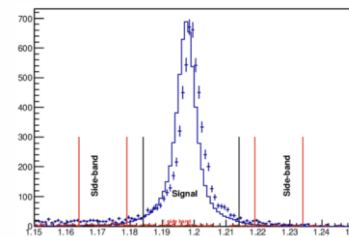
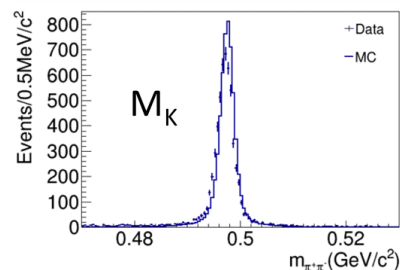
PWA of $J/\psi \rightarrow K^0 \Sigma^- \bar{\Xi}^+ + \text{c.c.}$

- To measure $\Xi(1690)$
- To confirm new state $\Xi(1720)$
- Significant Excited states
- PWA in progress

- Small Phase Space
- Many tracks
- Low momentum
- Low detection efficiency
- Partial reconstruction to improve the efficiency
 - Reconstruct $\bar{K}^0, \bar{\Xi}^+$ and calculate Σ^- with the missing 4-momentum



state	JP	Mass(MeV)	Width(MeV)	status
$\Xi(1690)$	$\frac{1}{2}-?$	1690 ± 10	20 ± 15	***
$\Xi(1820)$	$3/2-$	1823 ± 5	$24+15-10$	***
$\Sigma(1880)$	$1/2+$	~ 1880	~ 200	**
$\Sigma(1900)$	$1/2-$	~ 1925	~ 165	**
$\Sigma(1910)$	$3/2-$	~ 1910	~ 220	***
$\Sigma(1915)$	$5/2+$	~ 1915	~ 120	****
$\Xi(1720)$	$3/2+?$	$1720 \sim 1730$	$30 \sim 50$	



本年度工作情况：

指导研究生工作：常洋洋

Partial Wave Analysis of $J/\psi \rightarrow K^+ K^- \eta'$

PWA to measure and understand

$\phi(1680)$, $X(1750)$...

$$\psi(3686) \rightarrow K^+ K^- \eta$$

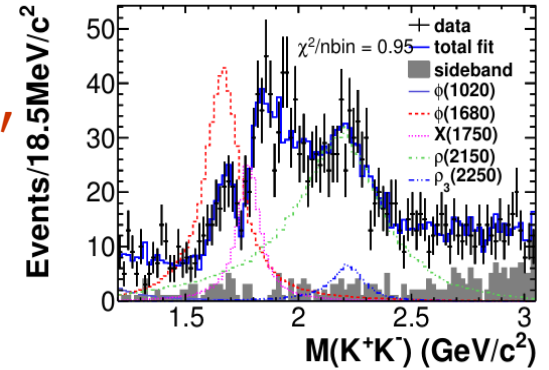
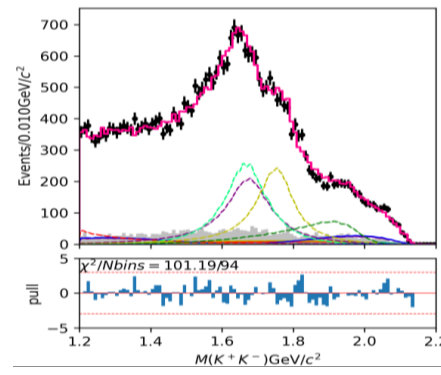
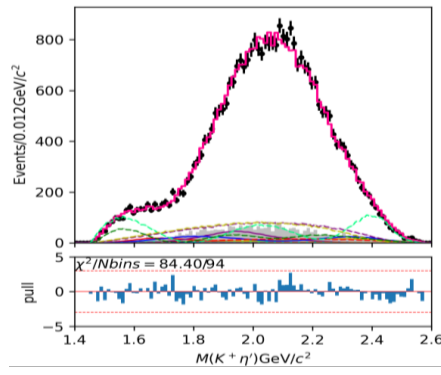
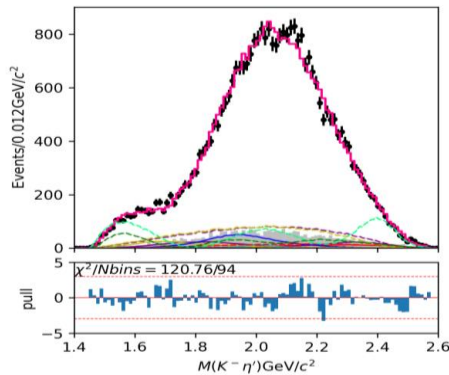
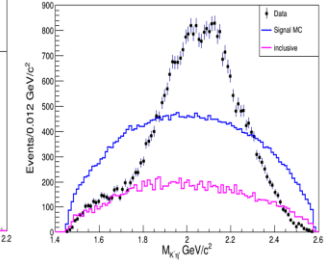
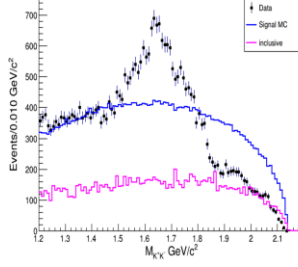
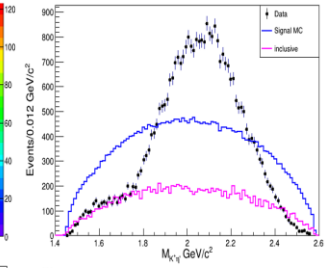
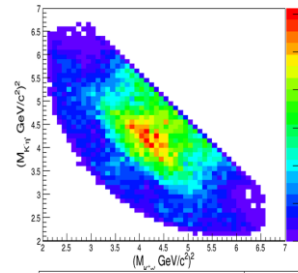
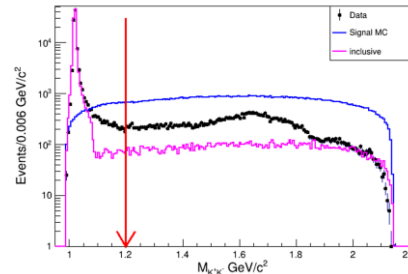
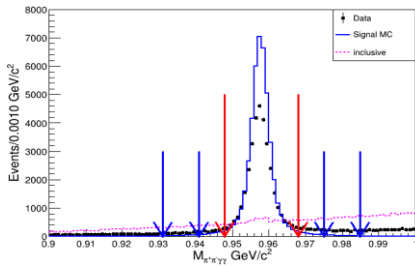
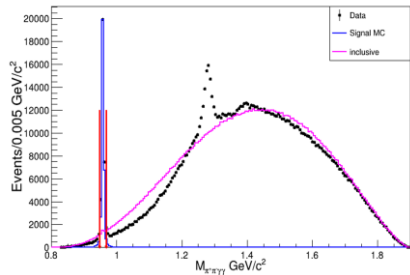


Table 1: Decay trees and their respective initial-final states.

rowNo	decay tree (decay initial-final states)	iDecTr	iDecIFSts	nETr	nCETr
1	$J/\psi \rightarrow \pi^+ \pi^- \eta K^+ K^-$, $\eta \rightarrow \gamma\gamma$ ($J/\psi \rightarrow \pi^+ \pi^- K^+ K^- \gamma\gamma$)	0	0	9674	9674
2	$J/\psi \rightarrow \eta K^+ K^-$, $\eta \rightarrow \gamma\gamma$, $K^+ \rightarrow \pi^+ K^+$, $K^- \rightarrow \pi^- K^-$ ($J/\psi \rightarrow \pi^+ \pi^- K^+ K^- \gamma\gamma$)	2	0	1577	11251
3	$J/\psi \rightarrow K^+ K^- \eta'$, $\eta' \rightarrow \pi^+ \pi^- \eta$, $\eta \rightarrow \gamma\gamma$ ($J/\psi \rightarrow \pi^+ \pi^- K^+ K^- \gamma\gamma$)	1	0	1405	12656
4	$J/\psi \rightarrow \pi^0 K^+ K^-$, $K^+ \rightarrow \pi^+ K^+$, $K^- \rightarrow \pi^- K^-$ ($J/\psi \rightarrow \pi^0 \pi^+ \pi^- K^+ K^- \gamma\gamma$)	11	2	40	12696
5	$J/\psi \rightarrow \eta \gamma \eta$, $\eta \rightarrow \pi^0 \pi^+ \pi^- K^+ K^-$ ($J/\psi \rightarrow \pi^0 \pi^+ \pi^- K^+ K^- \gamma\gamma$)	19	2	21	12717
6	$J/\psi \rightarrow \pi^0 K^+ K^-$ ($J/\psi \rightarrow \pi^0 \pi^+ \pi^- K^+ K^-$)	9	5	20	12737
7	$J/\psi \rightarrow \pi^+ \eta K^+ K^-$, $\eta \rightarrow \gamma\gamma$, $K^+ \rightarrow \pi^+ K^+$ ($J/\psi \rightarrow \pi^+ \pi^- K^+ K^- \gamma\gamma$)	23	0	13	12750
8	$J/\psi \rightarrow \pi^0 K^+ K^-$, $K^+ \rightarrow e^+ e^-$ ($J/\psi \rightarrow e^+ e^- \pi^0 K^+ K^-$)	36	9	11	12761
9	$J/\psi \rightarrow \pi^+ \eta K^+ K^-$, $\eta \rightarrow \gamma\gamma$, $K^+ \rightarrow \pi^+ K^+$	17	0	9	12770

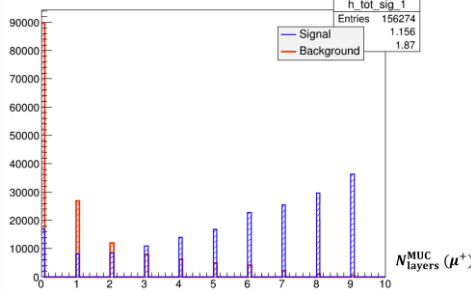
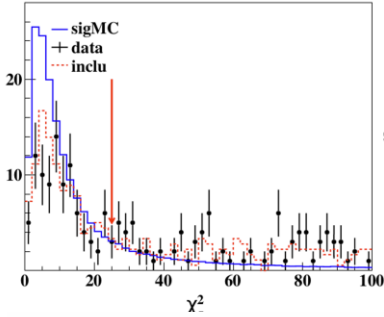


本年度工作情况：

指导研究生工作：张泽祥

Search for Electromagnetic Dalitz decays

$\psi(3686) \rightarrow \mu^+\mu^-\eta'$



The momentum (p) of μ^+/μ^- (GeV/c)	The depth (L) in MUC (cm)
$p < 0.6$	No cut
$p \in [0.6, 1.1)$	$L > (-37.4 + 68 \times p)$
$p > 1.1$	$L > 40$

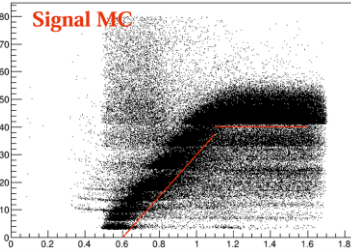


表2 本项目拟研究电磁达利兹衰变的理论预期分支比.

拟研究的电磁达利兹衰变	理论预期的分支比			
	VMD 模型 [32-34]	微扰 QCD [9,35]	有效拉氏量 [36,37]	色散理论 [38]
$J/\psi \rightarrow \mu^+\mu^-\pi^0$	$(1.01^{+0.03}_{-0.04}) \times 10^{-7}$	--	$(3.04 \pm 0.10) \times 10^{-7}$	$(2.7-3.3) \times 10^{-7}$
$J/\psi \rightarrow \mu^+\mu^-\eta$	$(0.30 \pm 0.01) \times 10^{-5}$	0.46×10^{-5}	$(0.40 \pm 0.01) \times 10^{-5}$	--
$J/\psi \rightarrow \mu^+\mu^-\eta'$	$(1.31 \pm 0.04) \times 10^{-5}$	1.72×10^{-5}	$(1.64 \pm 0.02) \times 10^{-5}$	--
$\psi(3686) \rightarrow \mu^+\mu^-\pi^0$	3.5×10^{-9}	--	--	--
$\psi(3686) \rightarrow \mu^+\mu^-\eta$	3.0×10^{-9}	--	--	--
$\psi(3686) \rightarrow \mu^+\mu^-\eta'$	3.7×10^{-7}	--	--	--
$h_c \rightarrow \mu^+\mu^-\eta$	--	4.6×10^{-6}	--	--
$h_c \rightarrow \mu^+\mu^-\eta'$	--	1.0×10^{-5}	--	--

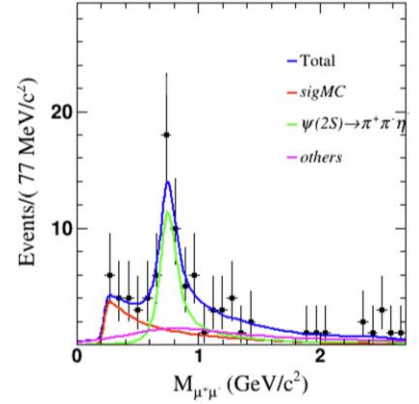
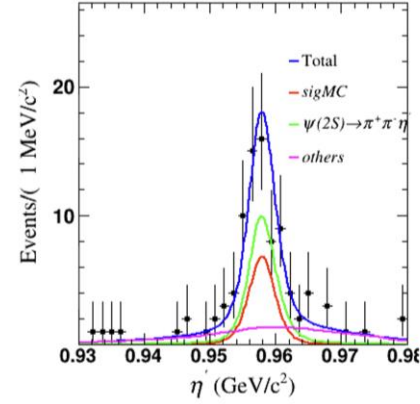


Table 1: Event trees and their respective initial-final states.

index	event tree (event initial-final states)	#EvTr	#EvIPSts	nEvs	nCmbEvs
1	$e^+e^- \rightarrow \psi(3686) \rightarrow \mu^+\mu^-\eta'$	5	0	73	73
2	$e^+e^- \rightarrow \psi(3686) \rightarrow \mu^+\mu^-\eta$	2	0	50	123
3	$e^+e^- \rightarrow \psi(3686) \rightarrow \mu^+\mu^-\pi^0$	0	0	24	147
4	$e^+e^- \rightarrow \psi(3686) \rightarrow \mu^+\mu^-\pi^+\pi^-\eta$	7	0	5	152
5	$e^+e^- \rightarrow \psi(3686) \rightarrow \mu^+\mu^-\pi^+\pi^-\eta'$	8	2	4	156
6	$e^+e^- \rightarrow \psi(3686) \rightarrow \mu^+\mu^-\pi^+\pi^-\eta$	9	0	4	160
7	$e^+e^- \rightarrow \psi(3686) \rightarrow \mu^+\mu^-\pi^+\pi^-\eta'$	1	0	3	163
8	$e^+e^- \rightarrow \psi(3686) \rightarrow \mu^+\mu^-\pi^+\pi^-\eta$	11	3	3	166
9	$e^+e^- \rightarrow \psi(3686) \rightarrow \mu^+\mu^-\pi^+\pi^-\eta'$	12	4	3	169
10	$e^+e^- \rightarrow \psi(3686) \rightarrow \mu^+\mu^-\pi^+\pi^-\eta$	14	3	2	171
11	$e^+e^- \rightarrow \psi(3686) \rightarrow \mu^+\mu^-\pi^+\pi^-\eta'$	16	0	2	173
12	$e^+e^- \rightarrow \psi(3686) \rightarrow \mu^+\mu^-\pi^+\pi^-\eta$	4	1	1	174
13	$e^+e^- \rightarrow \psi(3686) \rightarrow \mu^+\mu^-\pi^+\pi^-\eta'$	3	0	1	175
14	$e^+e^- \rightarrow \psi(3686) \rightarrow \mu^+\mu^-\pi^+\pi^-\eta$	13	0	1	176
15	$e^+e^- \rightarrow \psi(3686) \rightarrow \mu^+\mu^-\pi^+\pi^-\eta'$	6	1	1	177
16	$e^+e^- \rightarrow \psi(3686) \rightarrow \mu^+\mu^-\pi^+\pi^-\eta$	15	0	1	178
17	$e^+e^- \rightarrow \psi(3686) \rightarrow \mu^+\mu^-\pi^+\pi^-\eta'$	10	0	1	179

Peaking bkg

Non- η' bkg

Sample	$N(\times 10^9)$	N_{sig}	Efficiency (ϵ)	$\mathcal{B}(\eta' \rightarrow \pi^+\pi^-\eta)^{[1]}$	$\mathcal{B}(\eta \rightarrow \gamma\gamma)^{[1]}$
$\psi(3686) \rightarrow \mu^+\mu^-\eta'$	2.26	25.5 ± 7	17.77	0.425	0.3936

$$\mathcal{B}(\psi(3686) \rightarrow \mu^+\mu^-\eta') = \frac{N_{sig}}{N_{\psi(3686)} \cdot \mathcal{B}(\eta' \rightarrow \pi^+\pi^-\eta) \cdot \mathcal{B}(\eta \rightarrow \gamma\gamma) \cdot \epsilon} = (3.8 \pm 1.1) \times 10^{-7}$$

本年度工作情况：

- 经费情况

- 成功申请 自然科学基金面上项目

- 项目批准号：12475089
- 项目名称： $J/\psi \rightarrow \Xi \Xi \pi^0$ 和 $J/\psi \rightarrow K \Sigma(\Lambda) \Xi$ 的分波分析
- 资助金额： 50万元
- 执行时间： 2025.01.01 至 2028.12.31

- 正在主持 自然科学基金面上项目

- 项目批准号： 12075252
- 项目名称： Λ^* 和 Ξ^* 的寻找及研究
- 资助金额： 63万元
- 执行时间： 2021.01.01 至 2024.12.31

- 正在参与自然科学基金重点项目

- BESIII上胶球的寻找和轻介子谱的研究 在研（2020.01.01—2024.12.31）

- 文章发表：

- Study of Ξ^* in $\psi(3686) \rightarrow K^- \Lambda \bar{\Xi}^+ + c.c.$ 已发表 PRD 109, 072008 (2024)
- PWA of $J/\psi \rightarrow K^- \Sigma^0 \bar{\Xi}^+ + c.c.$ Draft ready BAM-00781
- PWA of $J/\psi \rightarrow K^- \Lambda \bar{\Xi}^+ + c.c.$ BAM-00781

本年度工作情况：

- **研究生培养** 指导两名硕士生：

- 张泽祥 Search for Electromagnetic Dalitz decays $\psi(3686) \rightarrow \mu+\mu-\eta'$
- 常洋洋 Partial Wave Analysis of $J/\psi \rightarrow K^+K^-\eta'$

- **学术活动**

- 参加合作组年会、物理软件会、轻强子组会等

- **公共服务**

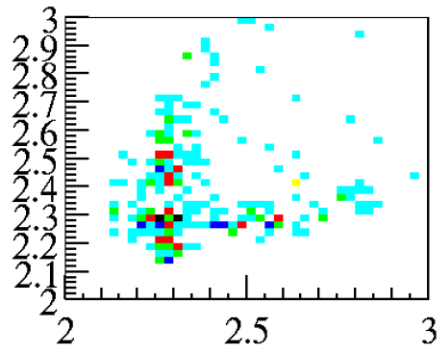
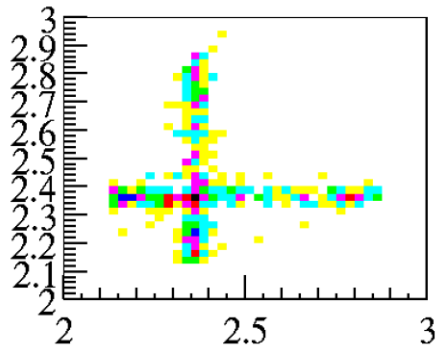
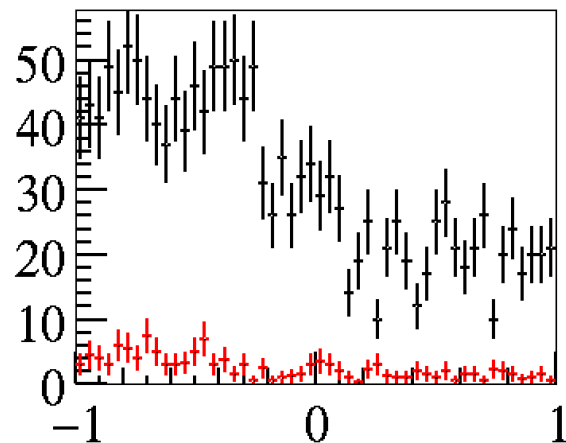
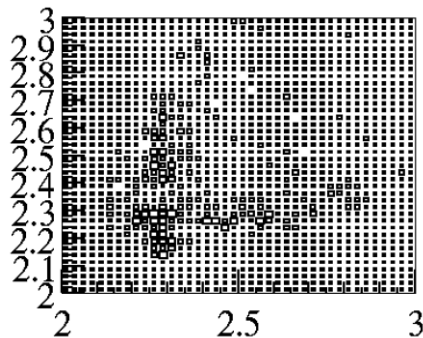
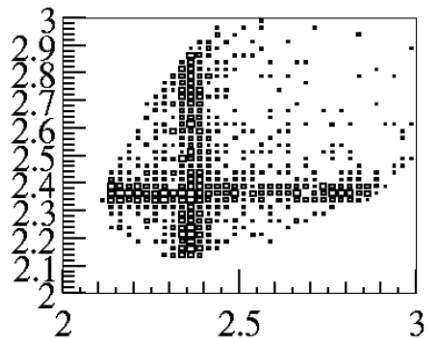
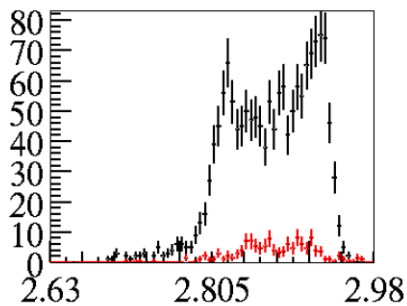
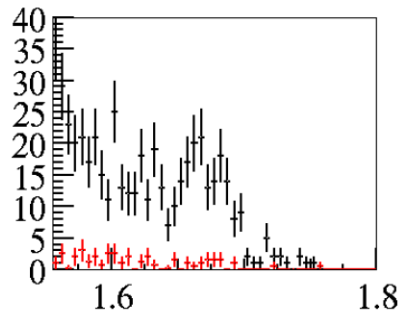
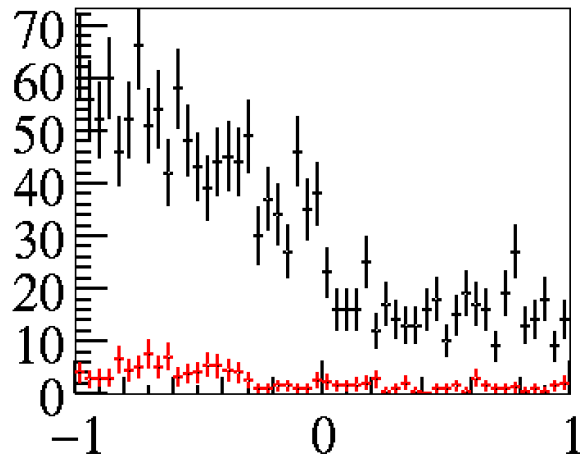
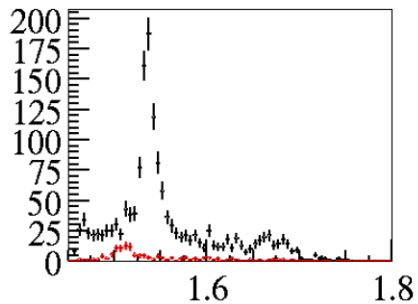
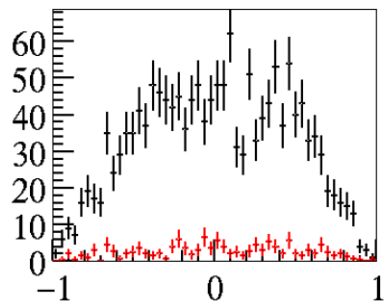
- 参加研究生考评和联培生面试
- referee工作

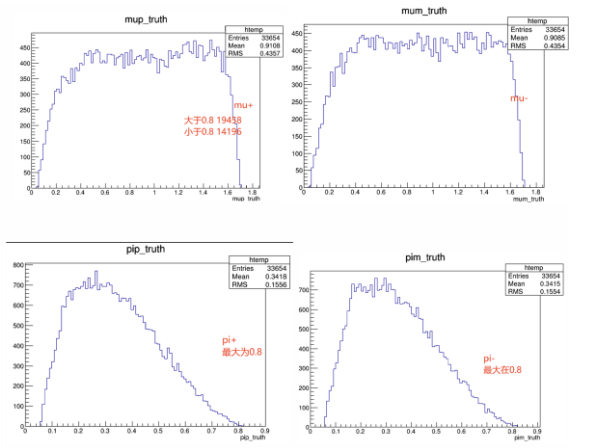
- BAM-00217 Confirmation of the X(1840) in $J/\psi \rightarrow \gamma 3(\pi^+ \pi^-)$ PRL
- BAM-00616: Study of $\psi(3686) \rightarrow p \bar{p} \pi^0$ and $\psi(3686) \rightarrow p \bar{p} \eta$
- BAM-00728: The Total Number of $\psi(3686)$ Taken in 2021 CPC
- BAM-00779: Search for Λ electric dipole moment in J/ψ decay
- BAM-00808: Observation of $\pi_1(1600)$ in $\psi(3686) \rightarrow \gamma \text{chic1, chic1} \rightarrow \pi \pi \eta'$
- BAM-00834: Study of $\eta_c \rightarrow \Xi^0 \bar{\Xi}^0$
- BAM-00860: Observation of X(2370) in $J/\psi \rightarrow \gamma K^+ K^0 \pi^0$ and $\gamma \pi^0 \pi^0 \eta$
- BAM-00882: PWA of $\psi(2S) \rightarrow K^+ \Sigma^0 \bar{\Xi}^0 \pi^0$

下年度工作计划：

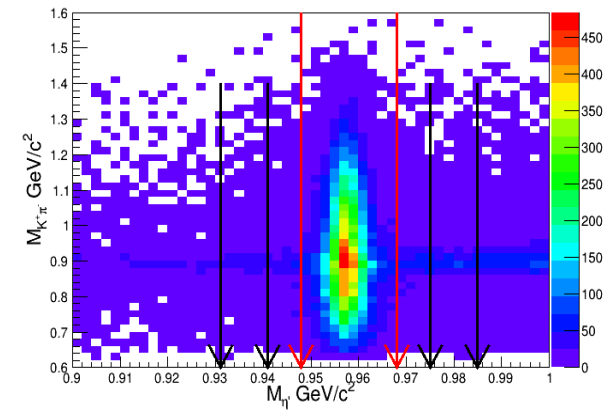
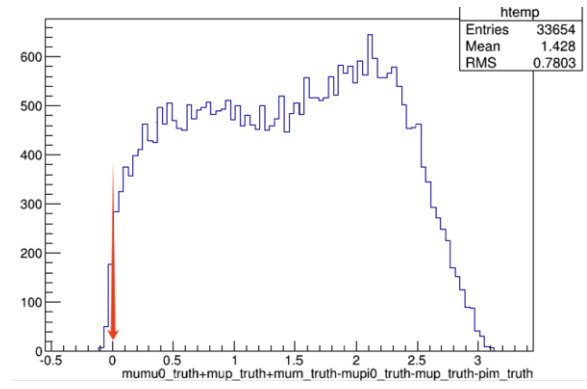
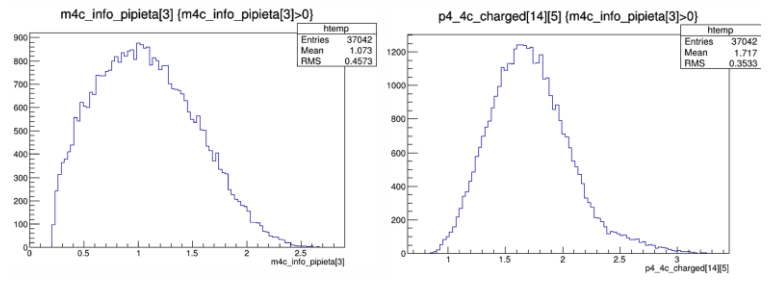
- 主持自然科学基金项目
 - $J/\psi \rightarrow \Xi \bar{\Xi} \pi^0$ 和 $J/\psi \rightarrow K \Sigma(\Lambda) \Xi$ 的分波分析
- 推进已完成分析工作的发表
 - PWA of $J/\psi \rightarrow K \Sigma^0 \bar{\Xi}^+ + \text{c.c.}$
 - PWA of $J/\psi \rightarrow K \Lambda \bar{\Xi}^+ + \text{c.c.}$
 - 分波分析方法中的分辨处理
- 进一步研究 $\Xi(1530)$ 的性质，从不同的衰变道去研究和验证
 - $J/\psi \rightarrow \Xi \bar{\Xi} \pi^0$ 的分波分析 + ...
- 新粒子 $\Xi(1720)$ 的进一步确认和研究
 - $J/\psi \rightarrow K^0 \Sigma^- \bar{\Xi}^+ + \text{c.c.} + \dots$
- 其他超子激发态的研究和新激发态的寻找.
- 基于 BESIII 数据展开其他方面的物理研究
- 研究生培养和公共服务

谢谢！





$$\psi(2S) \rightarrow \pi^+ \pi^- \pi^+ \pi^- \eta$$



$$J/\psi \rightarrow \eta K^* \bar{K}^*, \eta \rightarrow \gamma\gamma, K^* \rightarrow \pi^- K^+, \bar{K}^* \rightarrow \pi^+ K^-$$

$$(J/\psi \rightarrow \pi^+ \pi^- K^+ K^- \gamma\gamma) \textcircled{c}$$

