$J/\psi \to p\bar{p}K^{\pm}\pi^{\mp}$

H. X. Yang, Y. C. Zhu, B. S. Zou

IHEP

Contents

♠ Introduction

- *Select Events as:*
  $J/\psi \to pK^{\mp}\bar{\Lambda}(\Lambda)$
  $Br = (8.9 \pm 1.6) \times 10^{-4}$*(PDG value)*

- *To study* Λ^*, N^* *and* K^*
  Large uncertainty of mass and width of Baryons, especially for N^*

- *BESII Data*
  Run13691-Run16835
  1300 events selected

- *MC Data*
  0.8M
  86875 events selected

♠Events Selection

- *Good Track*
  - $mfit = 2, -19$
  - *Vertex*
    $|R_{xy}| < 0.12m$
    $|R_z| < 0.3m$
  - $|P| > 50MeV$
  - $|P_z/P_{tot}| < 0.85$
- *Good Event*
  - $N_{chrg} \geq 4$
  - $N_{goodtrk} = 4$
  - $Q_{tot} = 0$
  - $N_{p(\bar{p})} \geq 1$
    At least one $p($ *or* $\bar{p})$ *identified by TOF*

  - $\chi^2(p\bar{p}K^{\pm}\pi^{\mp}) < 50$

- *Final selection(Fig. 1)*
  - $\chi^2 < 20$
  - $0.35GeV < M_K(p,\beta) < 0.65GeV$
  - $M_{p(\bar{p})}(p,\beta) > 0.65GeV$
  - $1.10GeV < M_{\Lambda} < 1.13GeV$

♠Background Study

- *Possible background channels:*

  – $J/\psi \to p\bar{p}\pi^+\pi^-, (6.0 \pm 0.5) \times 10^{-3}$

  – $J/\psi \to \Lambda\bar{\Lambda}, (1.30 \pm 0.12) \times 10^{-3}$

  – $J/\psi \to PK^-\bar{\Sigma}^0, (2.9 \pm 0.8) \times 10^{-4}$

  – $J/\psi \to \Lambda\bar{\Lambda}\pi^0, (2.2 \pm 0.6) \times 10^{-4}$

  – $J/\psi \to p\bar{p}\pi^+\pi^-\pi^0, (2.3 \pm 0.9) \times 10^{-3}$

- *According to MC simulation, few background events can pass the events selection program(Fig. 2).*

♠Possible Resonances *(Fig. 3)*

- *Mass*($\bar{p}\pi^+$) *to find* $\bar{\Lambda}$
- *Mass*(pK^-) *to find* Λ^*
- *Mass*($\bar{\Lambda}K^-$) *to find* N^*
- *Mass*($\bar{\Lambda}p$) *to find* K^*

♠Analysing with FDC

- *FDC(Feynman Diagram Calculation)*
- *Preliminary work with FDC (Fig. 4)*
- *To study the parameters of Resonances Quantum numbers, Mass, Width...*
- *New Resonances?*
- *Contribution of every resonance to total distribution, Branching Ratios*

♠Summary

- *1300 events of* $J/\psi \to pK\Lambda$
- *Obvious signals of Resonances*
  $\Lambda(1520), \Lambda(1690), N(1650)...$
- *FDC system runing well*

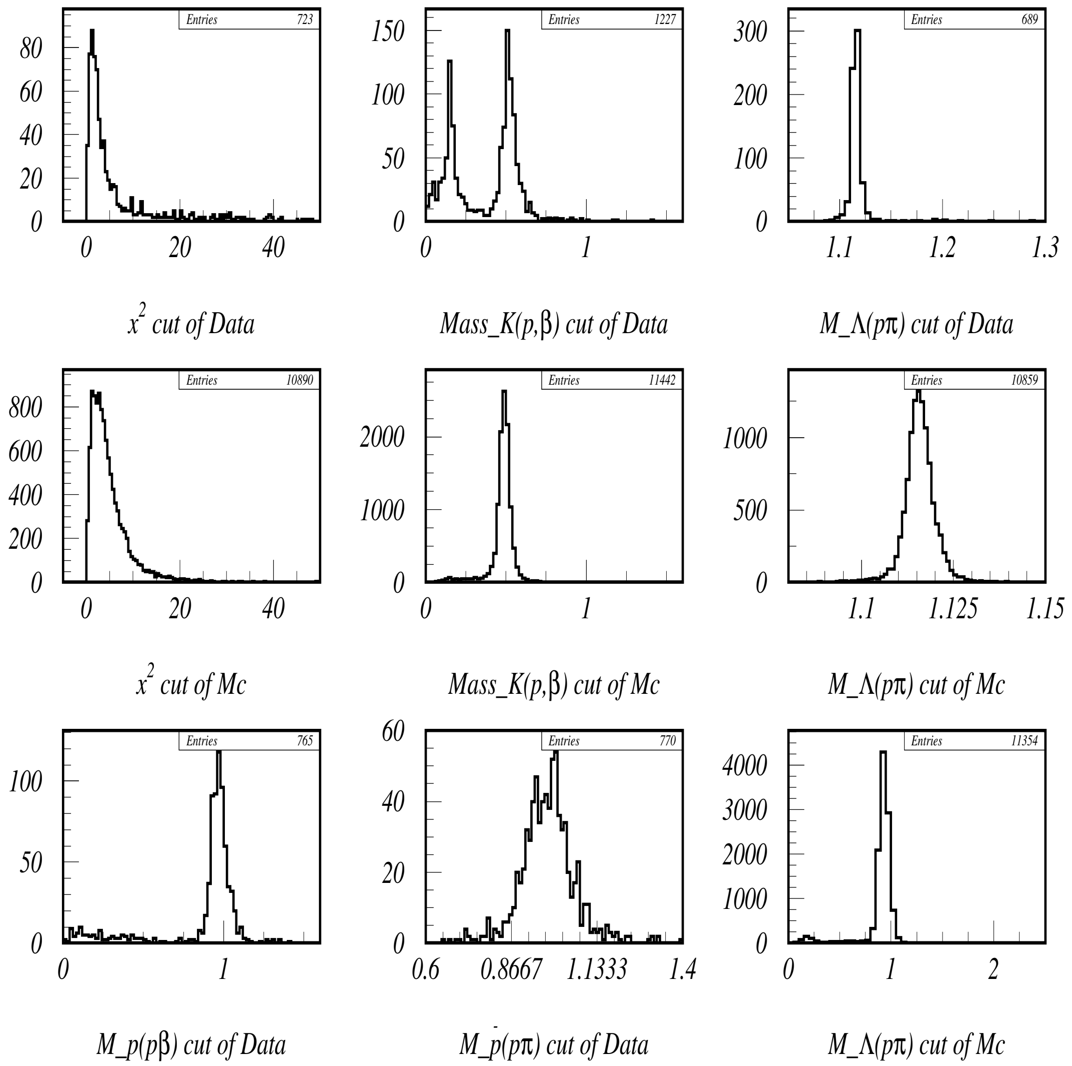

Figure 1: Final cut conditions

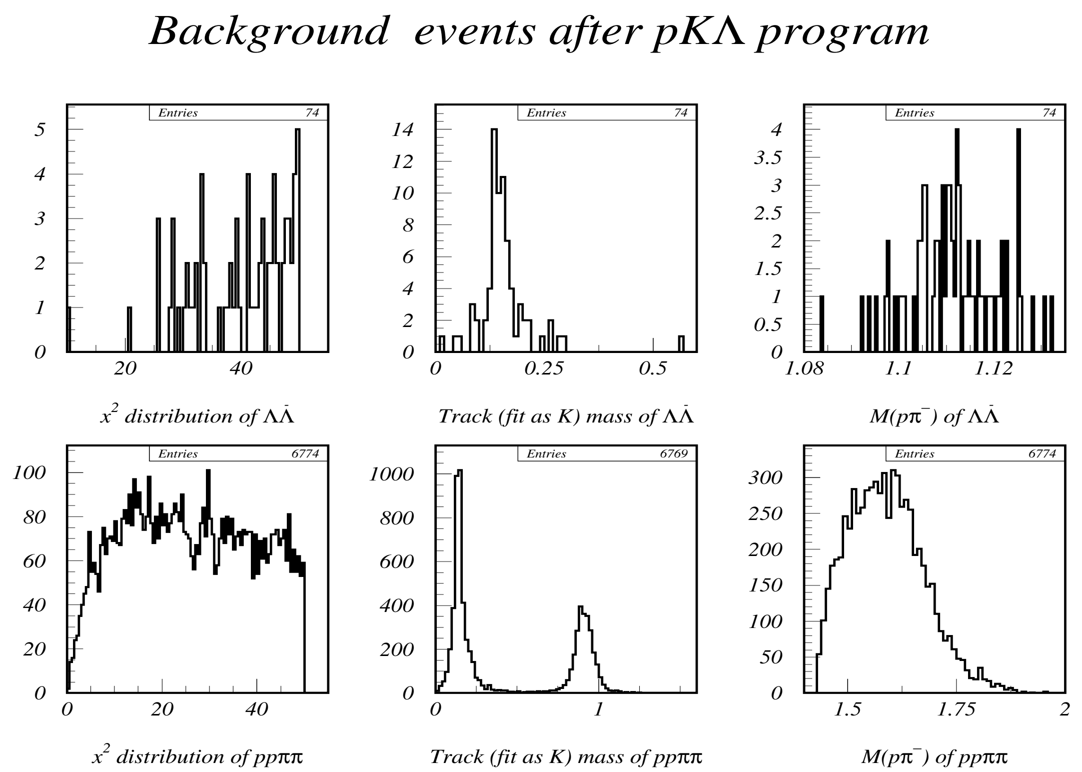

Figure 2: Background study

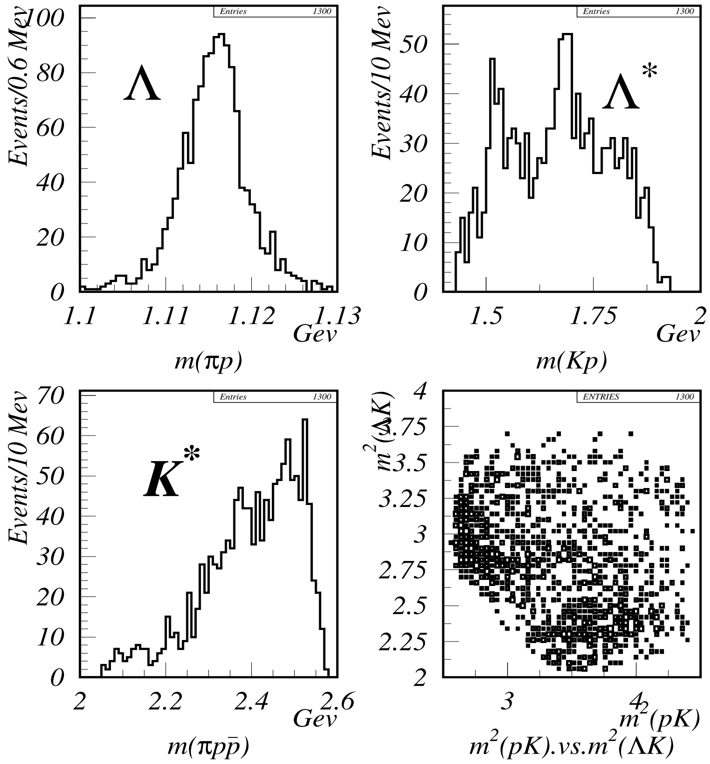

Figure 3: Background study

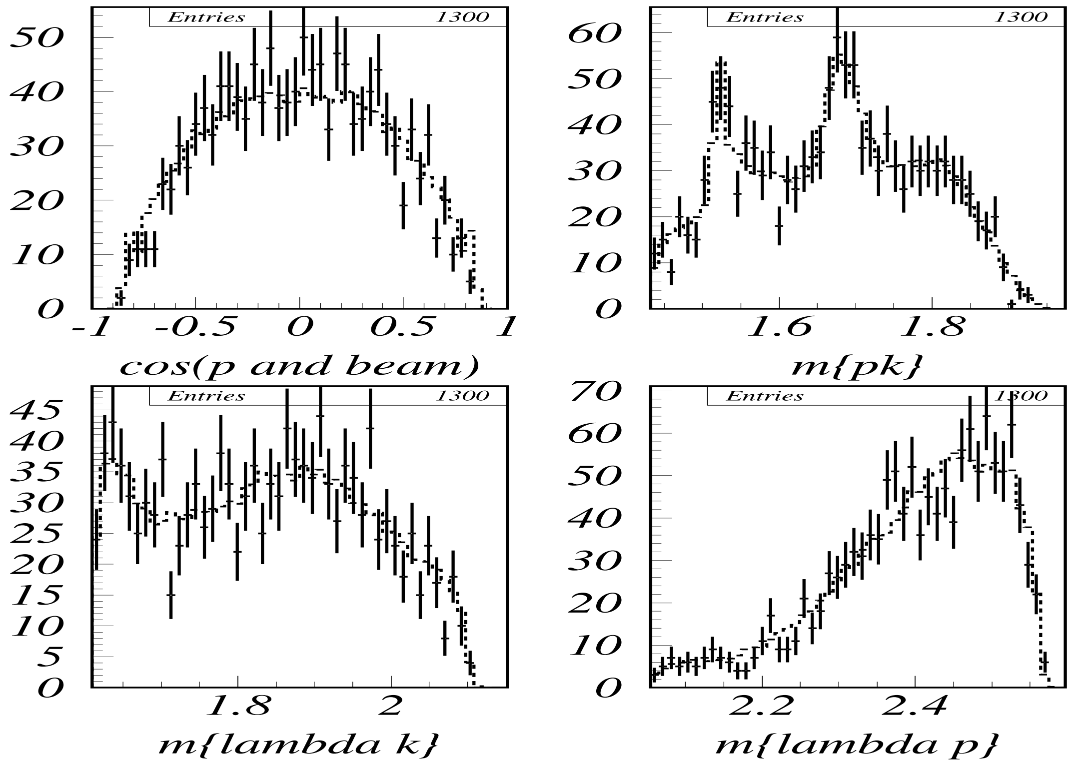

Figure 4: Background study