The Study of Light Hadron Spectroscopy by using $J/\psi \to \pi^+\pi^-\pi^0$ Channel at *BesIII*

Irshad Muzaffar

University of Science and Technology of China

subhani@mail.ustc.edu.cn

August 14, 2017

Motivation

- Decays properties of J/ψ provides an excellent source of an events with which to study Light Hadron spectroscopy and search for Glueballs, Hybrids and Exotic states.

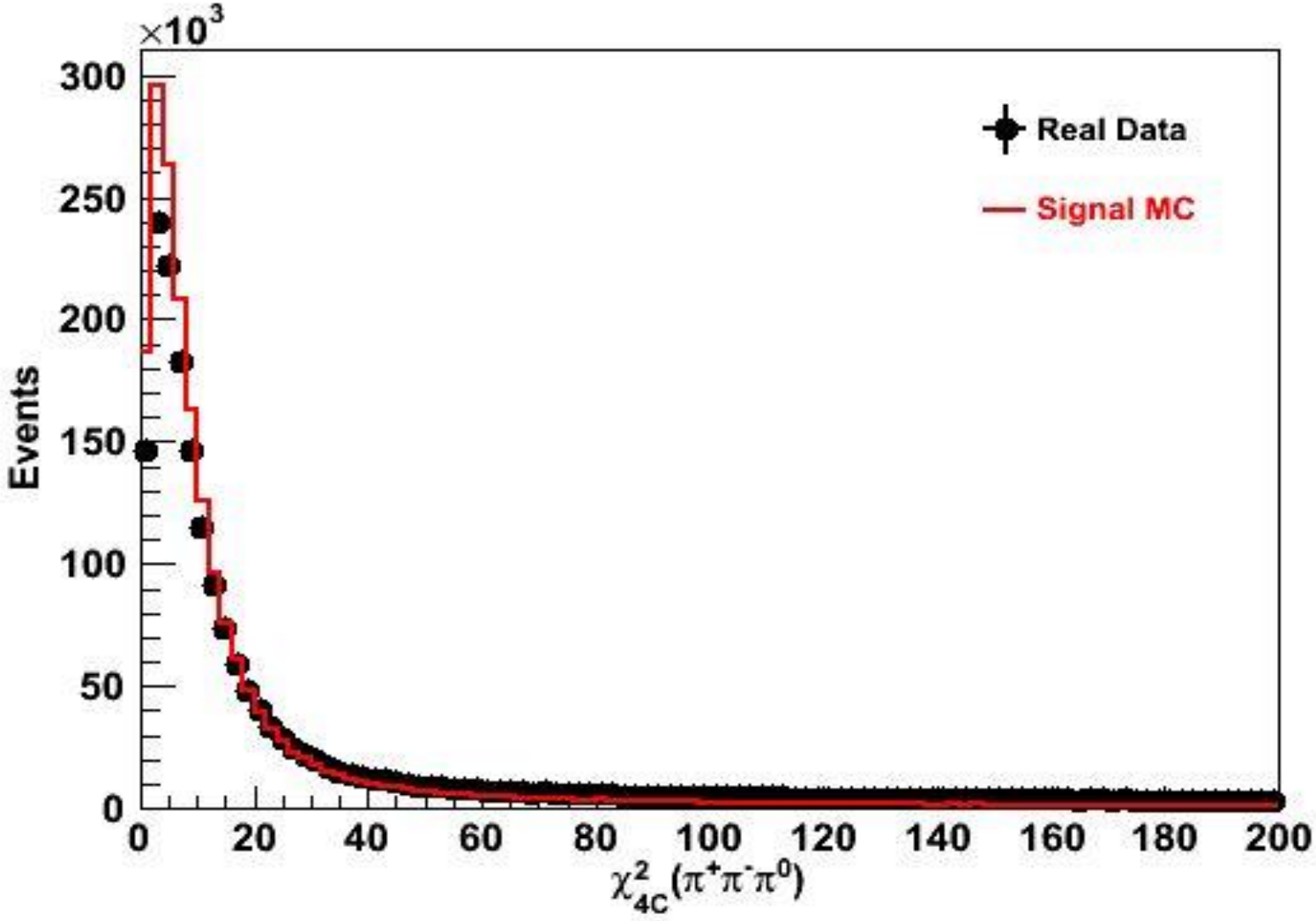
Boss version and Data Sets

- **Boss Version:**
  - Boss 664p01
  - 2009 Data with Run No. for MC {-9947,0,-10878}
  - Real Data of J/psi 2009

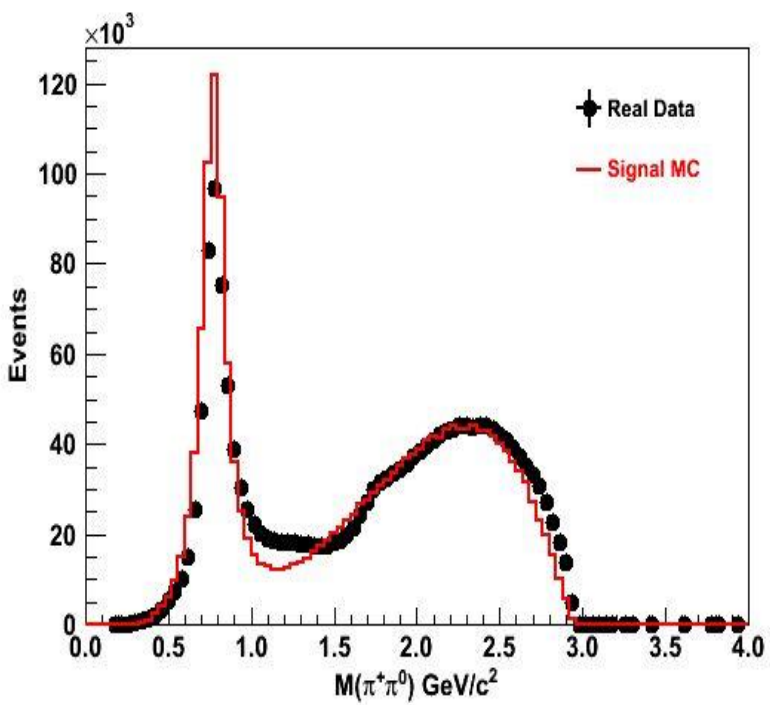
Event Slection of $J/\psi \rightarrow \pi^+ \pi^- \pi^o$

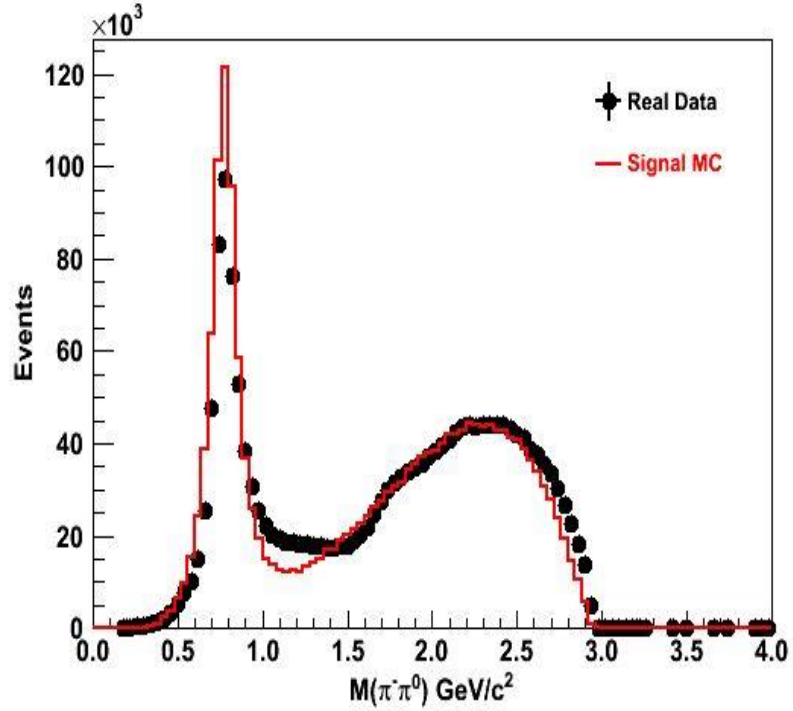
- **Good Charged Track:**
  - $|V_z| < 10\,cm$, $|V_r| < 1\,cm$ and $|\cos\theta| \leq 0.8$
  - $N_{Good} = 2$
- **PID with dE/dx and TOF:**
  - **Pions:** $Prob_\pi > Prob_K and\ Pro_\pi > Prob_$p
  - **At least one pion should Identified:** $N(\pi^+) = N(\pi^-) = 1$
- **Neutral Track:**
  - $N_\gamma \geq 2$
- **Vertex Fit:**
  - $Primary\ Vertex\ (\pi^+\pi^-\pi^0)$
- **Kinematics Fit:**
  - $\chi^2_{4c}(\pi^+\pi^-\pi^0) < 200$

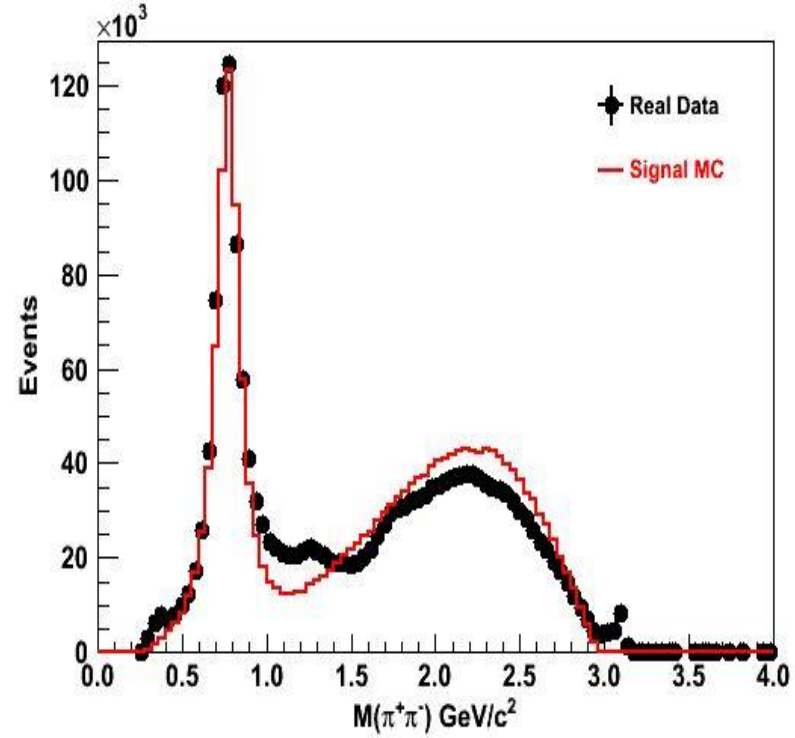
χ^2_{4c} Distribution of $J/\psi \rightarrow \pi^+\pi^-\pi^o$



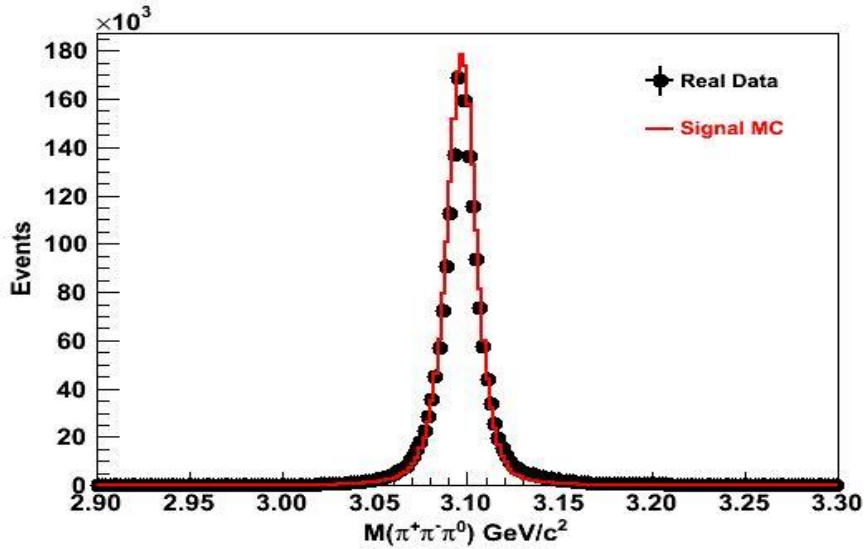
Invariant Mass of pion

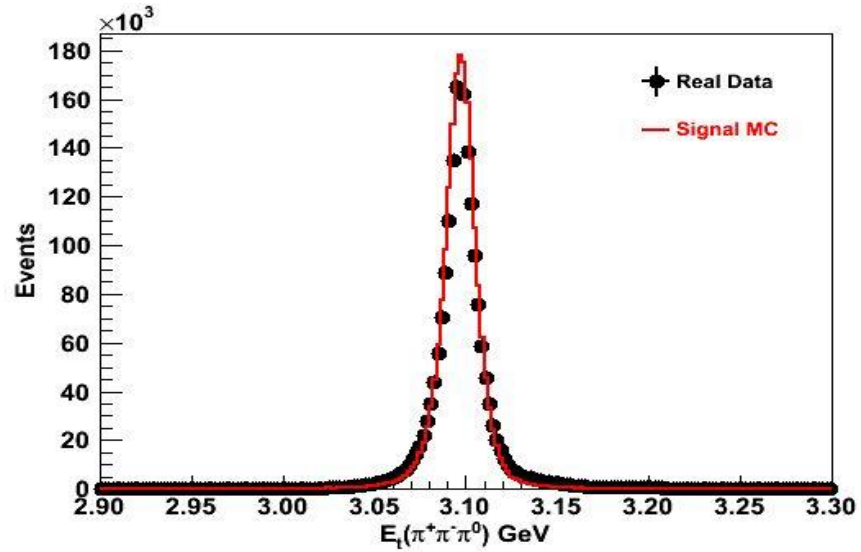


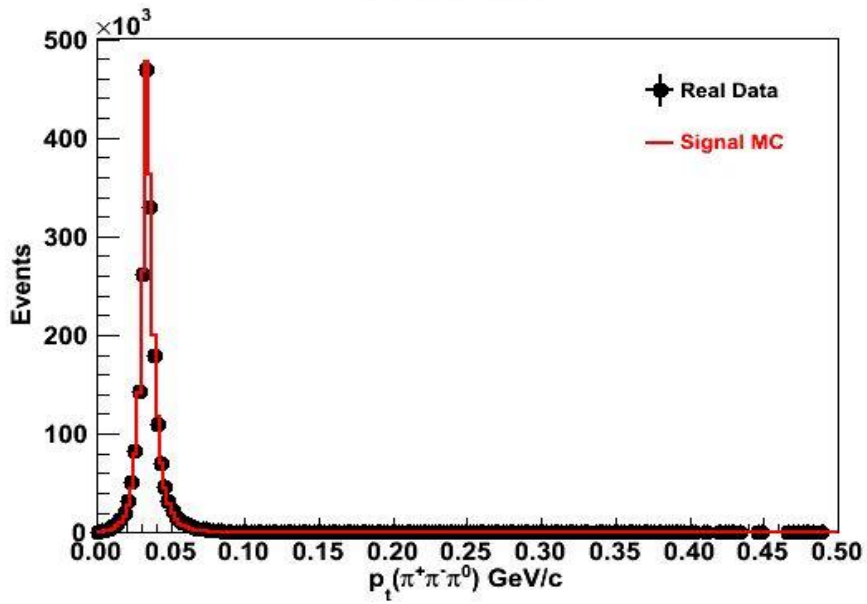


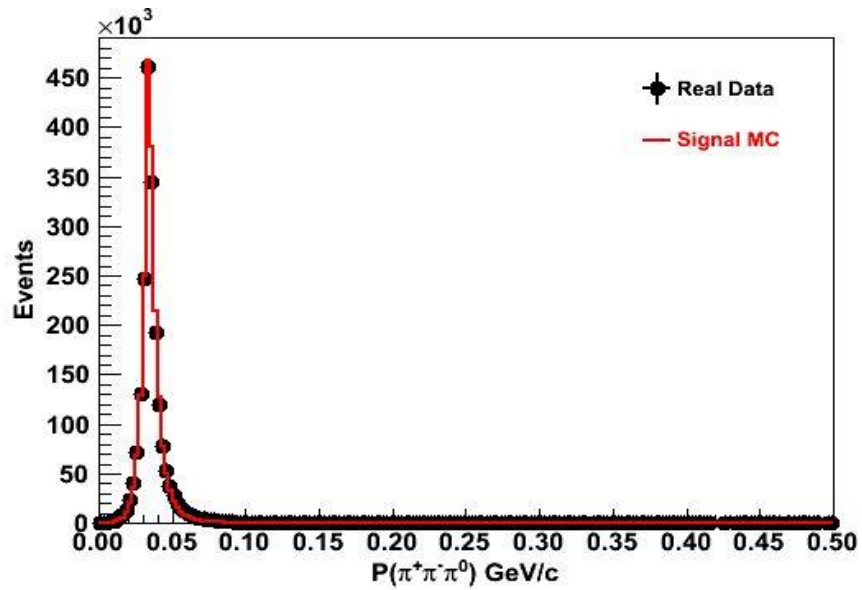


$J/\psi \rightarrow \pi^+\pi^-\pi^o$

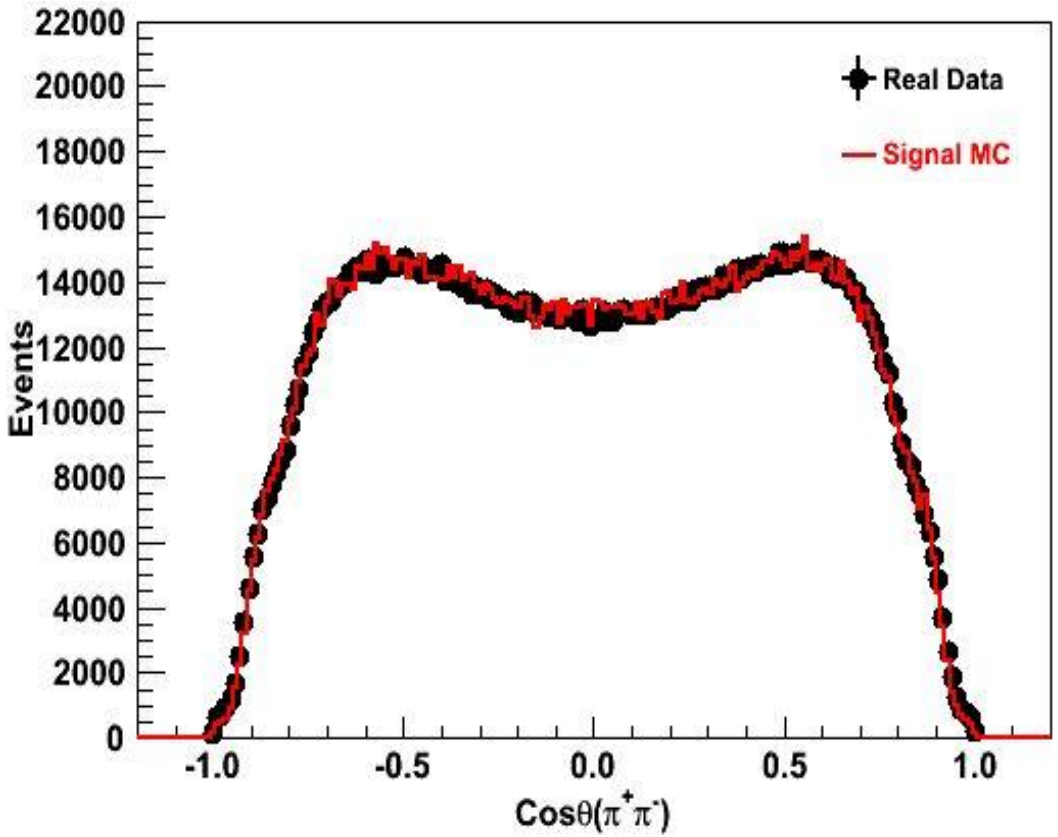


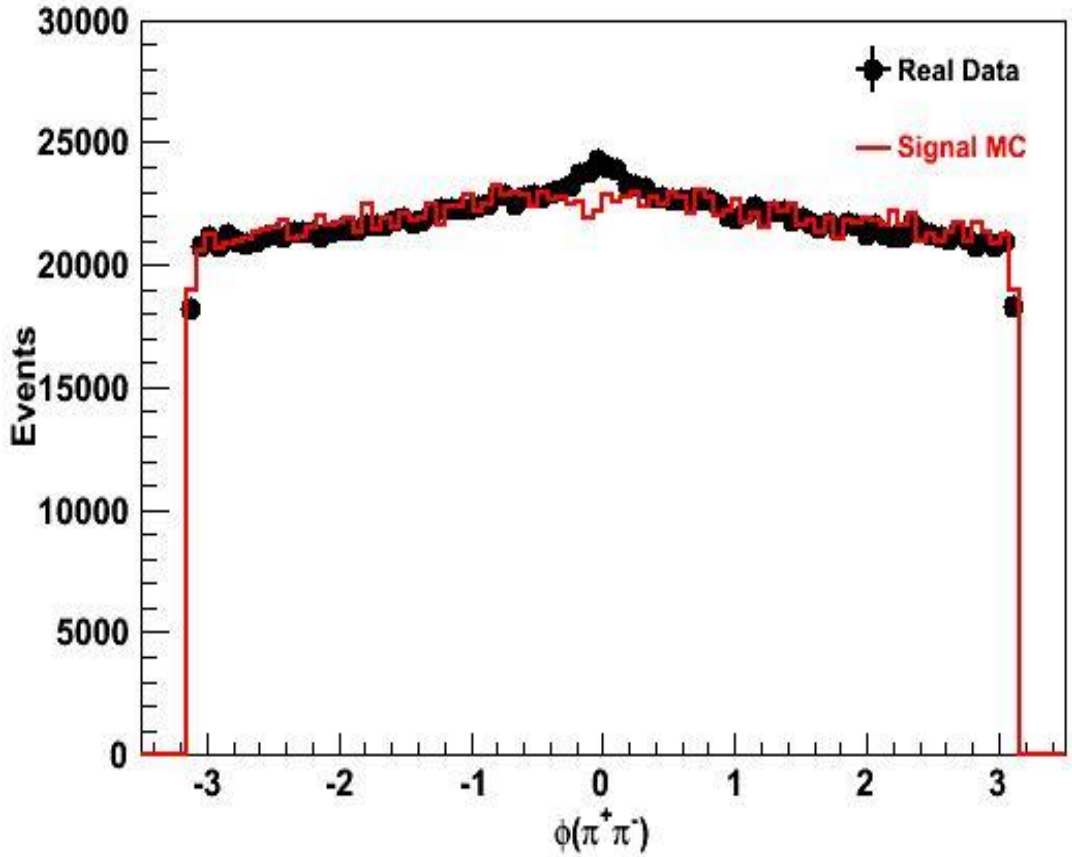






$Cos\theta$ and ϕ Distribution of $\pi^+\pi^-$





Dalits Plot for J/ψ