Measurement of Branching Fractions of Hadronic Decays of the Ω_c^0 Baryon

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Physics picture

- Omega_c^0 comprises the combination of a charm quark and two strange quarks
- The ground state Omega_c^0 has (ss) diquark structure in a spin-parity of 1^+ configuration.
- The ground state Omega_c^0 decays weakly

Physics picture

- Branching fraction of Omega_c decays
  - No measurements of the absolute branching fractions
  - some measurements of the branching fractions of modes with respect to the normalizing mode (Omega^- pi+) has been made

Physics picture

- ground state of the charmed baryons all decays predominantly through the weak decay.
- But Omega_c^0 is unique. It has two strange quarks, which have the same flavor. This leads to the interference effect plays important roles in the decays.

Analysis

- firstly, reconstruct the normalizing mode.

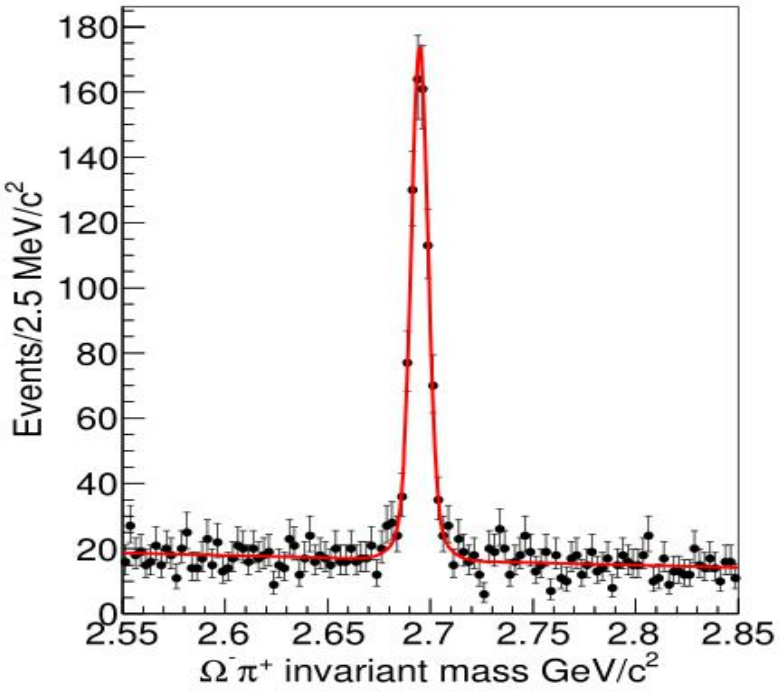

FIG. 1. Invariant mass distribution for the normalizing mode $\Omega_c^0 \to \Omega^- \pi^+$. The fit is described in the text.

Analysis

reconstruct the other modes to be measured.

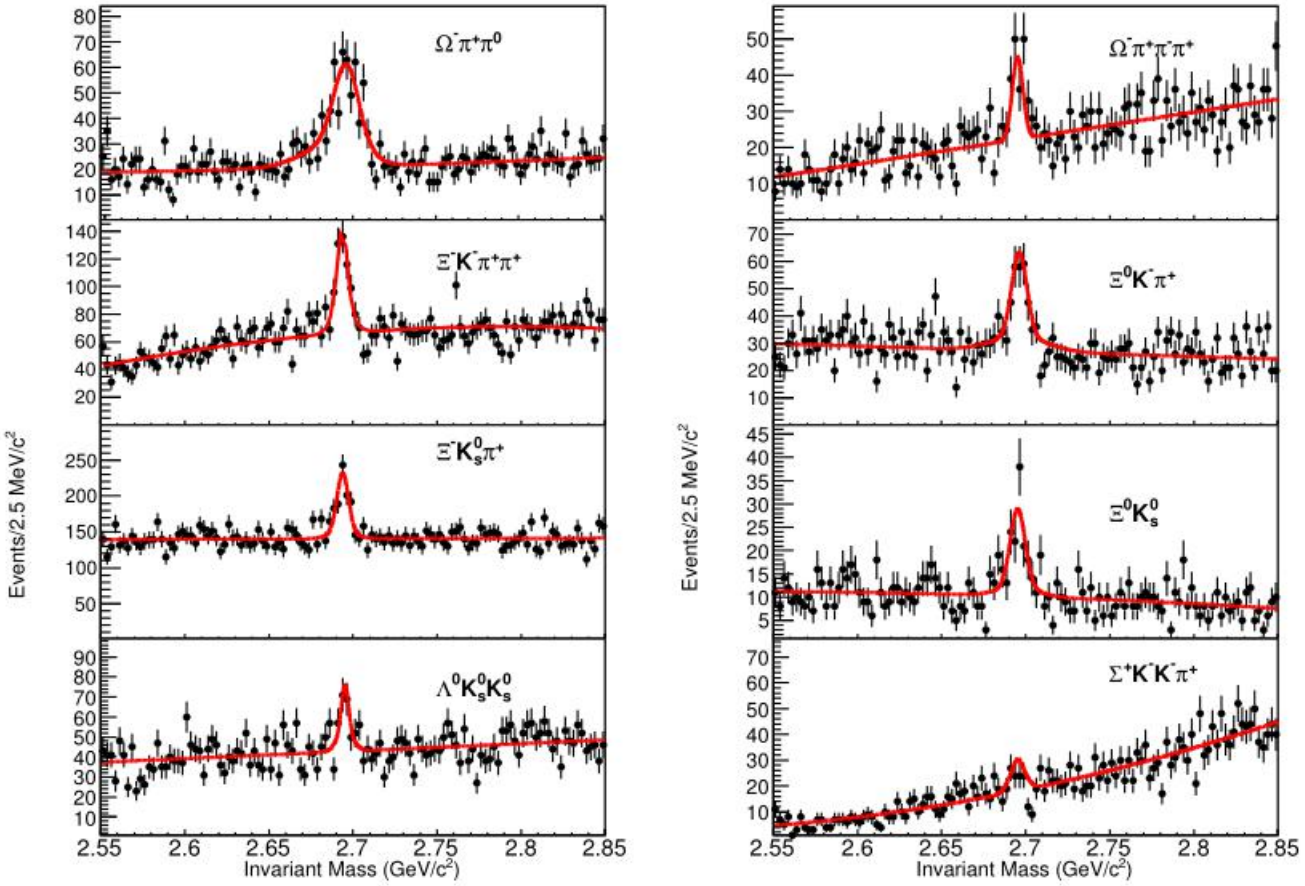

FIG. 2. Invariant mass distributions for the eight modes under consideration. The fits are described in the text.

Summary of highlights of this analysis

- For having two strange quarks with the same falover, the ground state of charmed baryon Omega_c^0 is plays an unique role in the study of the charmed baryon decays. The precise measurement of the branching fractions will help us deepen our understanding of its decay mechanism, especially, the interference effect in its decays.
- An good example of studing the relative branching fractions when the absolute branching fractions are not available.

THANKS