Cascade Update Ξ^-

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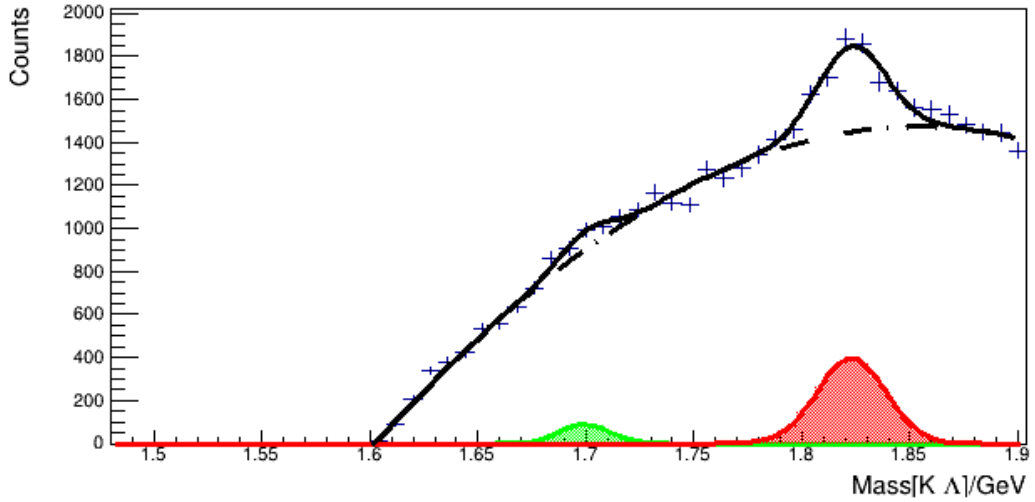
Outline

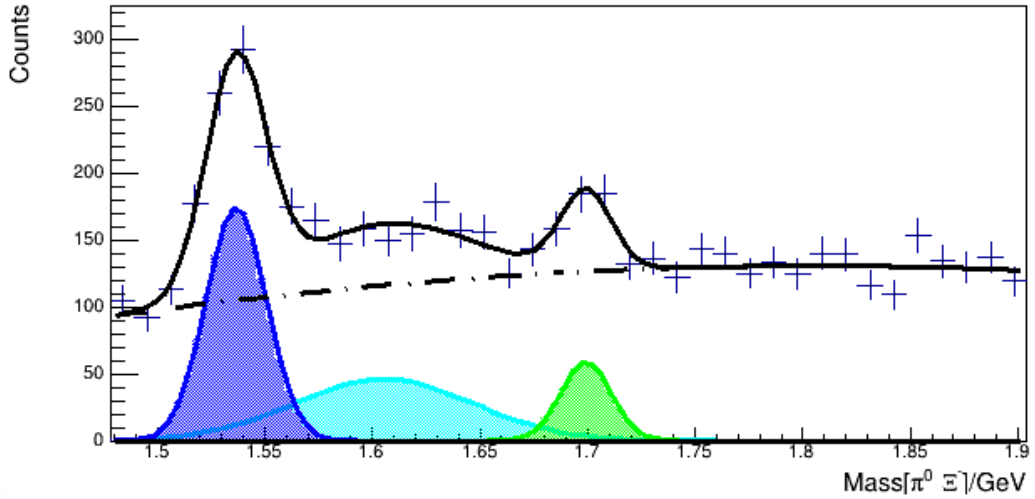
- Simulanteous fitting between $K^-\Lambda$ channel and $\Xi^-\pi^0$ channel
- Data comes from Fall 18 for $K^-\Lambda$ and spring 18 for $\Xi^-\pi^0$

Cuts on Data

- Mass cut on Λ from 1.107 to 1.124 GeV/ c^2
- Mass cut on Ξ^- from 1.31 to 1.34 GeV/ c^2
- CL above 10^{-4}

Simultaneous Fitting





- $\Xi(1530)$
  - Center 1.536(1) GeV/c^2
  - Width 33(5) MeV/ c^2
- $\Xi(1620)$
  - Center 1.60(1) GeV/ c^2
  - Width 94(24) MeV/ c^2
- $\Xi(1690)$
  - Center 1.70(2) GeV/ c^2
  - Width 28(5) MeV/ c^2
- $\Xi(1820)$
  - Center 1.822(1) GeV/ c^2
  - Width 38(5) MeV/ c^2

- $\Xi(1530)$ PDG
  - Center 1.535(6) GeV/c^2
  - Width 9.9(+1.9,-1.7) MeV/c^2
- $\Xi(1620)$ PDG
  - Center 1.62 GeV/ c^2
  - Width < 55 MeV/ c^2
- $\Xi(1690)$ PDG
  - Center 1.69(1) GeV/ c^2
  - Width < 30 MeV/ c^2
- $\Xi(1820)$ PDG
  - Center 1.823(5) GeV/ c^2
  - Width 24(+15,-10) MeV/ c^2

3rd degree polynomial background with independent parameters

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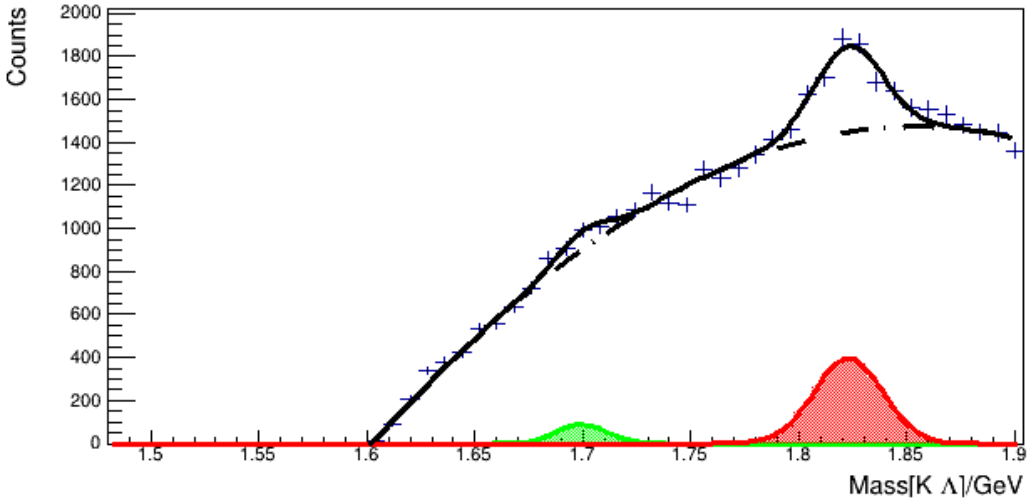
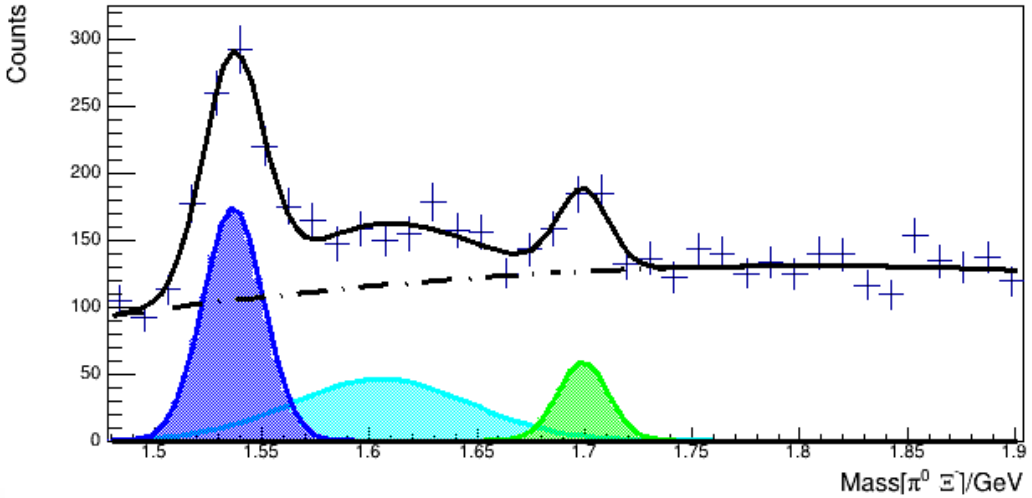
Simultaneous Fitting





- The branching ratio of Xi(1690) between $K^-\Lambda$ and $\Xi^-\pi^0$ is not listed in PDG.
- The Xi(1690) has an unknown J^P in the PDG
- The Xi(1620) is a one-star PDG state omitted in summary table.

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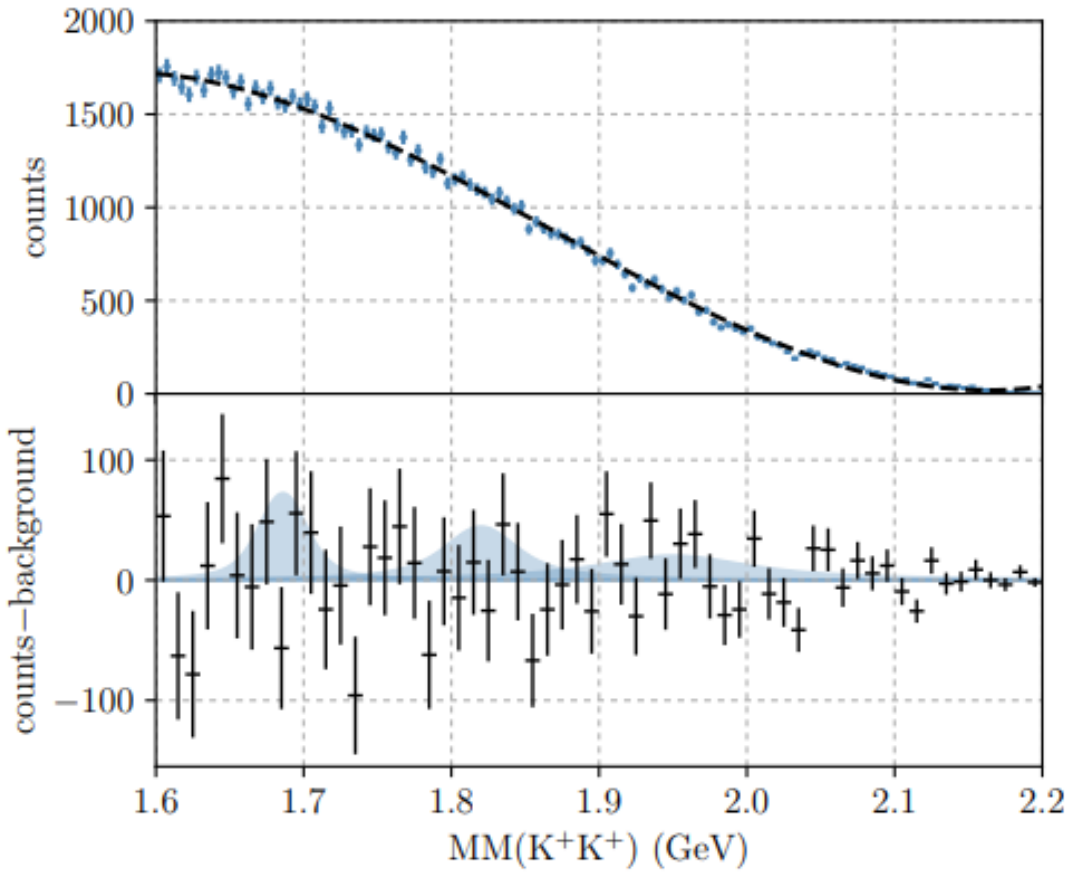
CLAS results of excited Xi mass states



- Published CLAS data of the missing mass of the K+ K+ system shows no evidence of higher mass cascade states

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Conclusion

- Evidence of $\Xi(1690)$ in both $K^-\Lambda$ and $\Xi^-\pi^0$ channels,
- GlueX measurement of branching ratio $\Gamma[\Xi(1690) \to K^-\Lambda]/\Gamma[\Xi(1690) \to \Xi^-\pi^0]$ will be a first-time measurement

End