BESIII Charm Meeting
Measurement of CP even fraction F_+ in $D^0 \to K^+K^-\pi^+\pi^-$

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BESIII Charm Meeting

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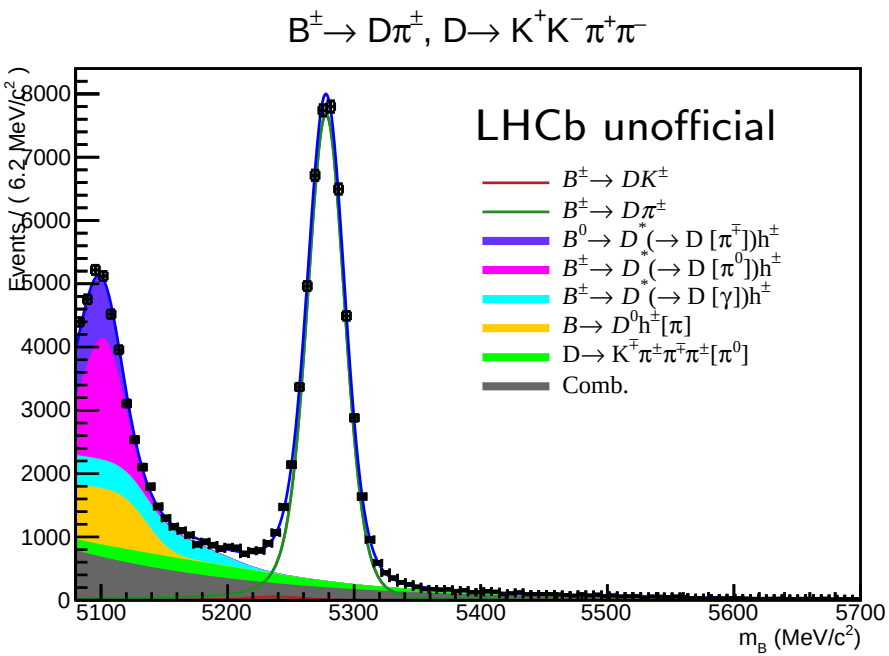
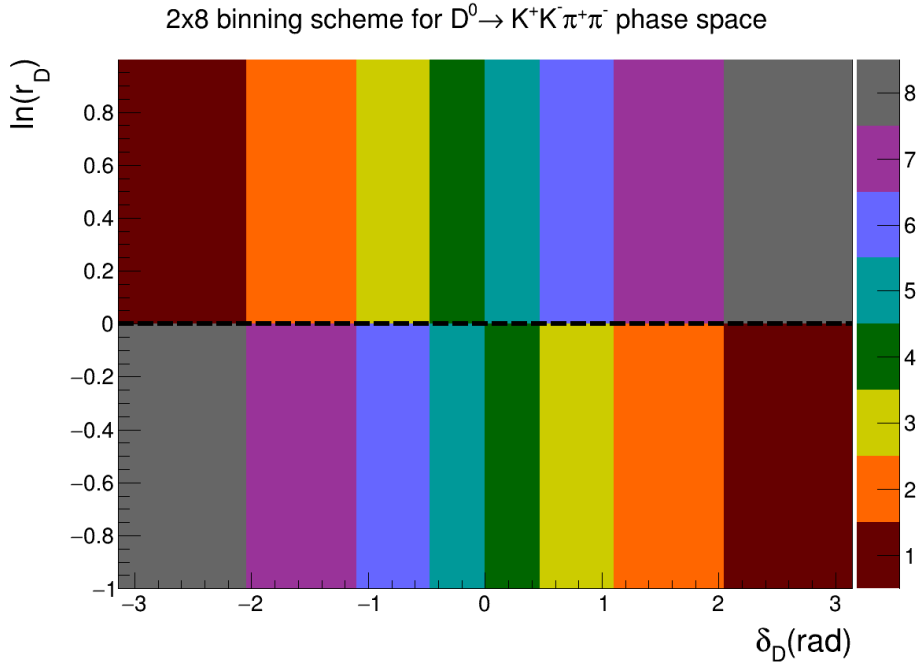
Outline

Introduction

- Original plan (for my PhD):
  - c_i/s_i analysis with new $20\,\text{fb}^{-1}$ BESIII $\psi(3770)$ dataset
  - Develop binning scheme using LHCb model JHEP 02 (2019) 126
  - Perform model independent γ measurement at LHCb simultaneously
    - Expected precision $\Delta\gamma \approx 12^\circ$ with LHCb Run 1+2



(a) Fit of $B^\pm \to [K^+K^-\pi^+\pi^-]_D\pi^\pm$



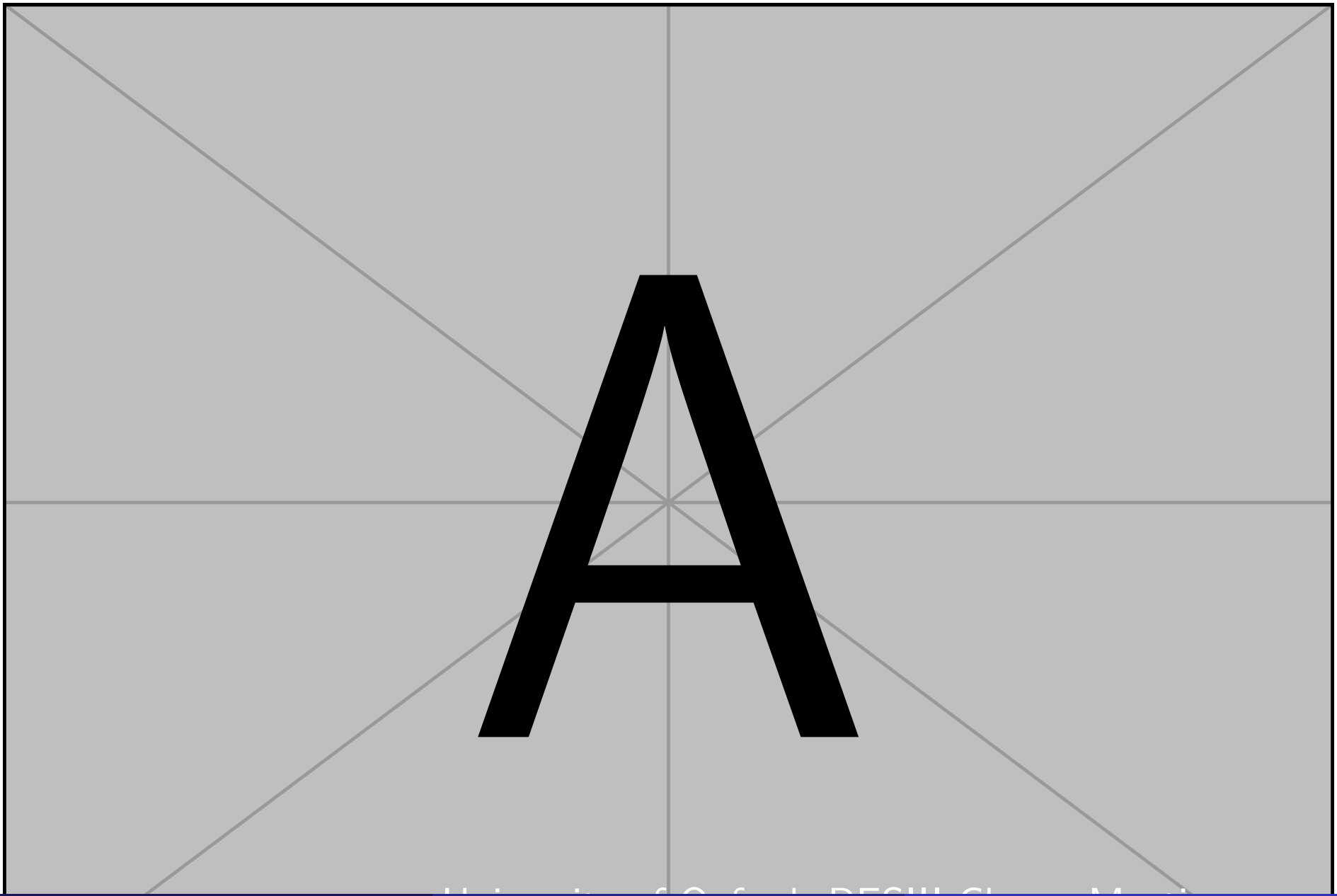
(b) Binning scheme for $D^0 \to K^+K^-\pi^+\pi^-$

Motivation

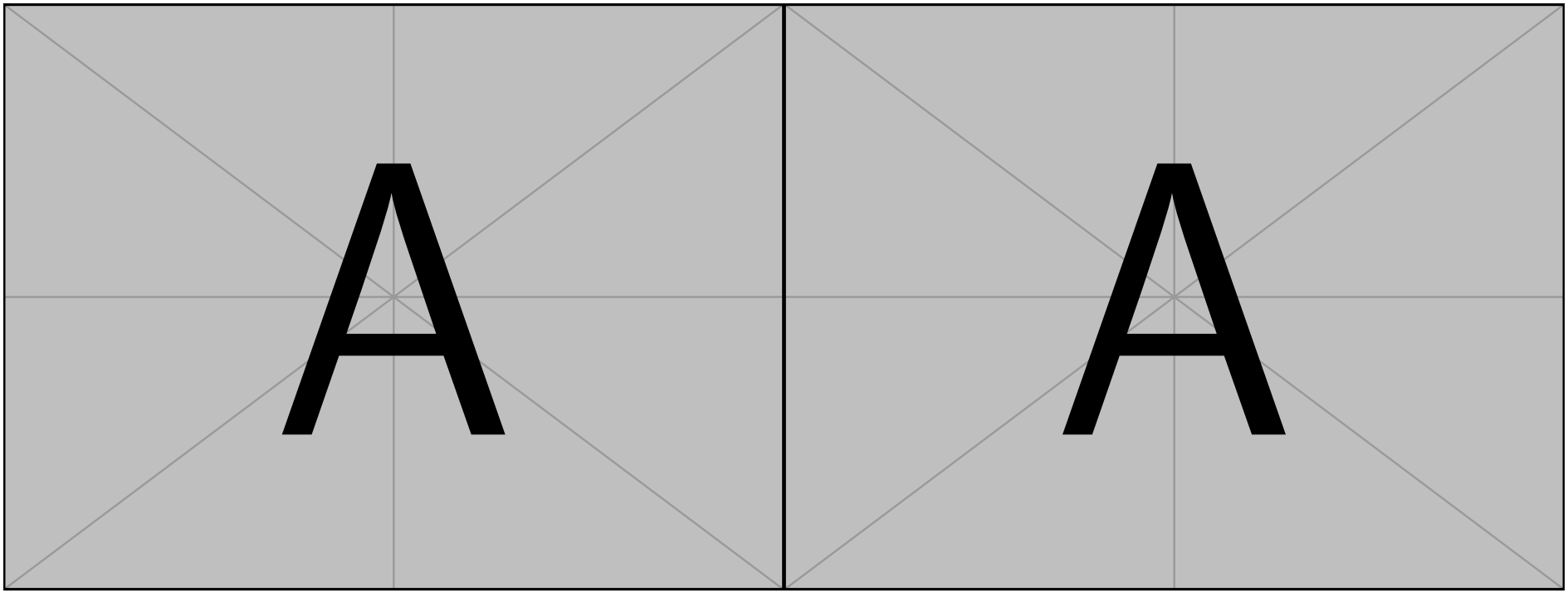
- CP even fraction F_+ describes the CP content of a self-conjugate multi-body decay
  - $F_+ = 1$ (0) for CP even (odd) final states
- F_+ can be measured with current $3\,\text{fb}^{-1}$ dataset
  - Useful cross check of LHCb amplitude model
  - Allows current analyses to include $KK\pi\pi$ as a GLW mode
- Important input to quasi-GLW analysis of the CKM angle γ
  - Current GLW modes: KK, $\pi\pi$, $\pi\pi\pi\pi$
  - Small effort to include $KK\pi\pi$ to gain more statistics!
- Other F_+ measurements:
  - $D^0 \to \pi^-\pi^-\pi^+\pi^-$ JHEP 01 (2018) 144
  - $D^0 \to K_S\pi^+\pi^-\pi^0$ JHEP 01 (2018) 82
  - Both measurements are from CLEO-c, BESIII analyses ongoing

Strategy for c_i/s_i analysis

Selection



Tag modes



Summary

Thank you!