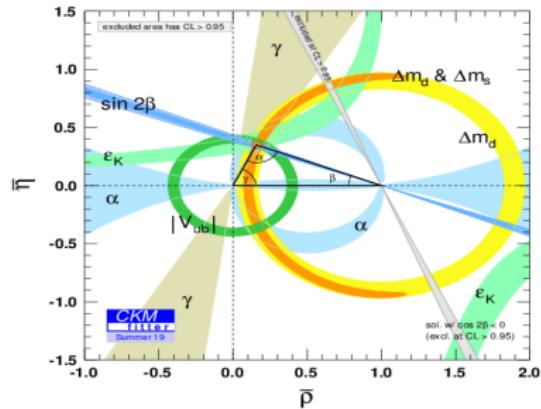


LHCb UK Annual Meeting 2021

Martin Tat

Oxford LHCb

7th-8th January 2021



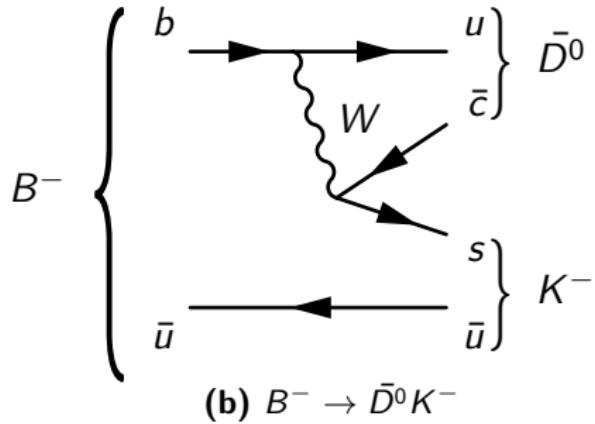
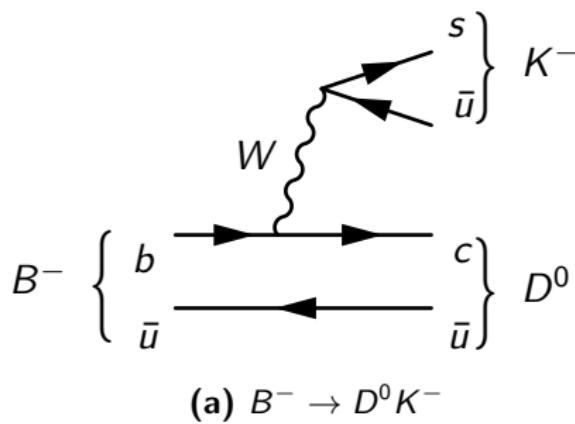
About myself



- From Kristiansand, Norway
- 4-year Master of Physics, University of Oxford
- PhD with LHCb at University of Oxford
- Supervisors:
 - Prof Guy Wilkinson (analysis)
 - Prof Neville Harnew (detector)

Thesis project: Model independent γ measurement

- $B^\pm \rightarrow DK^\pm, \quad D = D^0, \bar{D}^0$
 - $D \rightarrow K^+ K^- \pi^+ \pi^-$
- G. Wilkinson and J. Rademacker [arXiv:hep-ph/0611272](https://arxiv.org/abs/hep-ph/0611272)
- Interference between $b \rightarrow c$ and $b \rightarrow u \implies \gamma$ measurement!
- 4-body decay \implies 5-dimensional phase space
- Strong phase inputs from BESIII



Thesis project: Model independent γ measurement

- Unbinned model-dependent fit
 - LHCb isobar amplitude model [arXiv:1811.08304](https://arxiv.org/abs/1811.08304)
 - **AmpGen** by Tim Evans
 - Generate events and fit to the same model
 - γ precision: 11° with 2000 events
- Binned model-independent fit
 - Develop binning scheme
 - Pull studies

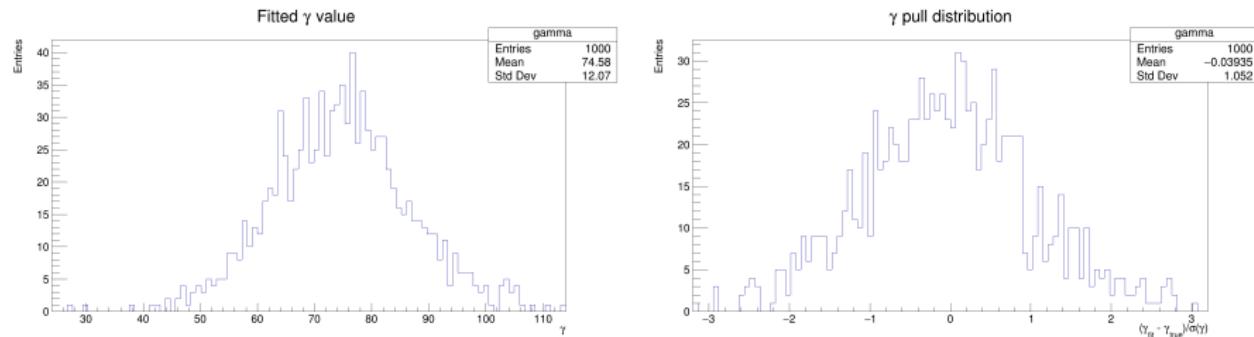


Figure 3: Pull study with 8 bins.

Analysis results and next steps

- Binned model-independent fit results:
 - γ precision with 8 bins: 13° , 12° with further modifications
 - γ precision with 4 bins: 15° , 14° with further modifications
- Next steps:
 - Pick out events from LHCb and BESIII data
 - Extract strong phases from BESIII and measure γ at LHCb
 - TORCH with Prof Neville Harnew

Thank you!