IFIC Newcomers Fest 2025

Wang Rui

12/12/2025

About me

- I did my undergraduate in Dalian University of Technology, China
- Went to University of Glasgow, Scotland to get my MSc in Theoretical Physics
- Started working on particle physics during my PhD degree in Particle Physics at the University of Bristol, UK
- Joined IFIC in March 2025 as an ALLIES postdoctoral fellow

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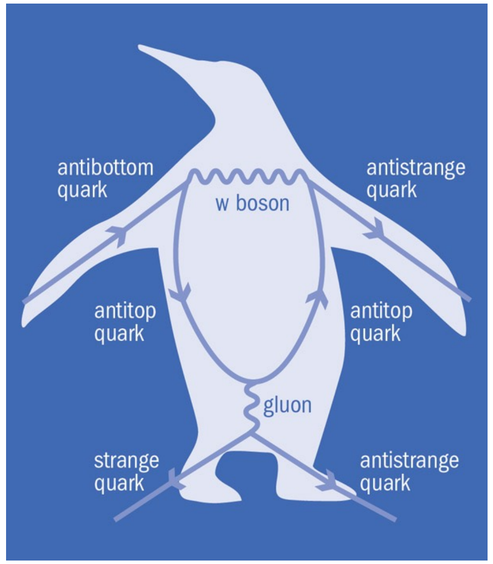
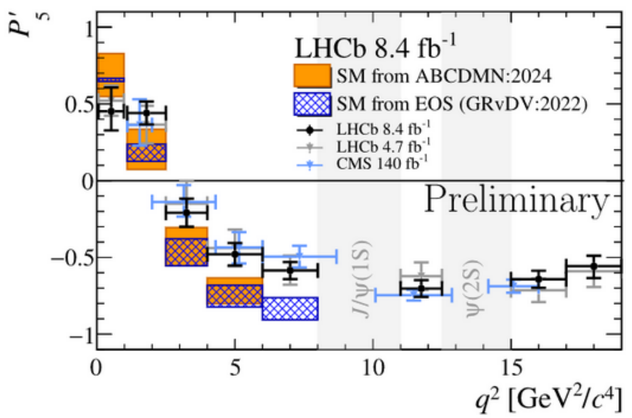
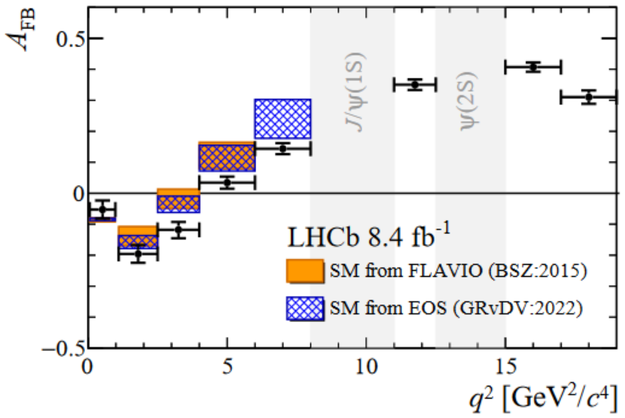
PhD: Unbinned amplitude ansatz analysis of the decay $B^0 \to K^{*0}\mu^+\mu^-$

- Supervisors: Dr. Konstantinos Petridis, Prof. Jonas Rademacker
- Worked full time on a rare decay analysis at the LHCb experiment
- The $b \to s\ell\ell$ transition is a flavour changing neutral current process, hence highly suppressed in the Standard Model
- Very sensitive to New Physics effects
- Perform an amplitude analysis of the decay $B^0 \to K^{*0}\mu^+\mu^-$ using an amplitude ansatz method







ALLIES ALL6: Edge computing hardware architectures for AI in scientific applications

- Proposed to develop low-power, high-speed computational systems for scientific and industrial applications
- Aim to train Machine Learning algorithms that can be implemented on FPGAs
- Year 1: IFIC, Valencia
  - Upgrade of the ATLAS Tile Calorimeter for the HL-LHC
- Year 2: ITEFI, Madrid

ALLIES
AI FOR SDGS

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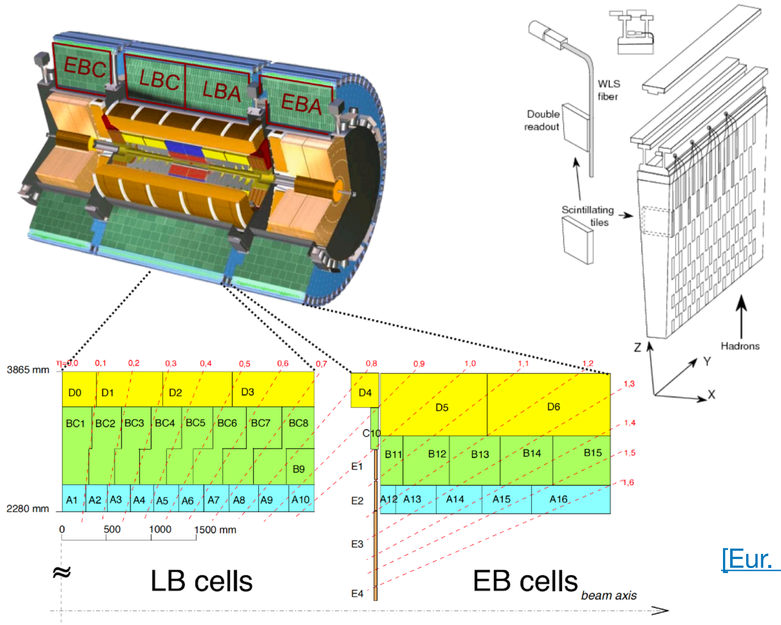
Upgrade of the ATLAS Tile Calorimeter for the HL-LHC

- Central hadronic calorimeter of the ATLAS experiment composed of scintillators (active) and steel (absorber)
- For the HL-LHC, higher data rates and pile-up, together with the need for real-time reconstruction, call for much more precise algorithms to replace the current ones
- Train Machine Learning algorithms with PyTorch
- Deploy them on Xilinx UltraScale FPGAs



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