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A Phase-Corrected method to measure the CKM γ angle

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The CKM angle γ is a free parameter of the Standard Model of particle physics that determines the level of CP-violation in the quark sector. Measurements of this parameter test the unitarity property of the CKM matrix and act as a sensitive probe for physics beyond the SM. As such, it is a focus of several analyses at LHCb. Direct measurements are usually limited by factors such as model-bias, external inputs or sample size. The Phase Correction method presented in this talk avoids all these problems, promising a new, precise gamma measurement using the golden channel: $B^{\pm} \to [K^0_S\pi^+\pi^-]_D K^{\pm}$.

A large source of uncertainty in γ can come from D-decay strong-phase models. We use both LHCb and BESIII datasets to explore the phase space of the D-decay. From them, we determine the strong-phase correction terms necessary to free the description of the strong-phase from any model bias. The unbinned LHCb and BESIII fits maximise the information from both datasets.

Here, I will present the phenomenology of the method and the progress of the ongoing measurement. Our studies show that this has the potential to be the most precise single γ measurement to date.

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