

# Amplitude analysis of $B^+ \rightarrow D^- K^+ \pi^+$ decays

Monday 7 April 2025 17:30 (15 minutes)

In this talk, I present an amplitude analysis of  $B^+ \rightarrow D^- K^+ \pi^+$  decays using the full data samples collected by the LHCb experiment at the Large Hadron Collider in Run I and II. The structure in the Dalitz plot of the decay allows us to study excited neutral charm meson states in the  $m(D^- \pi^+)$  system, measuring masses, widths and quantum numbers. The study of excited charm states is well motivated by a strong theory community, with their expected spectrum being well predicted.

Furthermore, I will outline a search for two exotic states, the  $T_{cs}^*$  tetraquarks, contributing to the  $B^+ \rightarrow D^- K^+ \pi^+$  decays in the  $m(D^- K^+)$  system. In recent years several exotic states have been discovered, but in most cases their exact nature is unknown. The exotic hadron candidates have been seen in  $m(D^- K^+)$  mass distributions in final states containing two charm mesons. Studying their production (or absence) in  $B^+ \rightarrow D^- K^+ \pi^+$  decays can help to shed light on their nature.

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