

# CP violation and mixing in charm hadrons at LHCb

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In 2019 the LHCb experiment published the first observation of CP violation in charmed particles, using decay channels  $D^0 \rightarrow \pi^+ \pi^-$  and  $D^0 \rightarrow K^+ K^-$ . Further measurements in different decay modes are essential in order to understand whether this effect can be explained by the Standard Model, or if new sources of CPV are needed. Here we present the latest searches for direct CP violation in several decay channels of charm hadrons, and discuss prospects for future measurements in LHC Run 3 and beyond.

With the recent discovery of time-independent CP violation in charm meson decays, the search for mixing-induced CP violation in the charm system becomes even more interesting. Here we report the latest LHCb measurements of charm mixing parameters and searches for time-dependent CPV using data collected in LHC Runs 1-2, and corresponding to the largest sample of charm mesons ever analysed. Measurements from several decay modes are presented, as well as prospects for future sensitivities.

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## Secondary track (number)

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