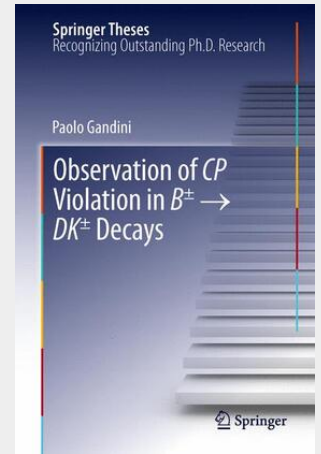


Gandini

Observation of CP Violation in $B^\pm \rightarrow DK^\pm$ Decays

CP violation is a well-established phenomenon in particle physics, but until 2001 it was only observed in kaons. In the last decade, several matter-antimatter asymmetries have been observed in neutral B mesons in line with the expectations of the Standard Model of the weak interaction. Direct CP violation is also expected in the decay rates of charged B^\pm mesons versus that of B^0 mesons, though the greatest effects are present in a decay that occurs just twice in 10 million decays. Such rarity requires huge samples to study and this is exactly what the LHC, and its dedicated B- physics experiment LHCb provide. This thesis presents an analysis of the first two years of LHCb data. The author describes the first observation of the rare decay, $B^- \rightarrow DK^-$, $D \rightarrow p\bar{K}^+$ and the first observation of direct CP violation in this B decay. The work constitutes essential information on the experiment's measurement of a fundamental parameter of the theory and stands as a benchmark against which subsequent analyses of this type will be compared.



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