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## Direct CP Violation in charmless three-body decays of B mesons

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Charmless three-body decays of  $B^+$  mesons are an excellent laboratory for direct CP violation (CPV) studies. While in two-body decays one measures a single number - the CP asymmetry in the partial decay rates - , in three-body decays the distribution of CP asymmetries across the two-dimensional phase space brings additional information on the underlying mechanisms.

Recently the LHCb collaboration performed a study of CP

asymmetries in the Dalitz plot of the decays  $B^+ \rightarrow \pi^+\pi^-\pi^+$ ,  $B^+ \rightarrow K^+\pi^-\pi^+$ ,  $B^+ \rightarrow K^+\pi^-K^+$ , and  $B^+ \rightarrow K^+K^-K^+$ . CP asymmetries as large as 80% were found in regions of the Dalitz plots. The distribution of the CP asymmetry across the phase space exhibit a complex pattern, which may be a consequence of the interplay between the weak and strong phases. In this talk these results will be presented and a possible interpretation will be discussed.

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