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Study of B -> K pi pi gamma decays

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In b -> s gamma transitions, the standard model predicts that B0 (antiB0) decays are related predominantly to the presence of right (left) handed photons in the final state. Therefore, the mixing-induced CP asymmetry in B -> fCP decays, where fCP is a CP eigenstate, is expected to be small. This prediction may be altered by new-physics (NP) processes in which opposite helicity photons are involved. Independently, decays to K pi pi gamma can display an interesting hadronic structure: they have contributions from several kaonic resonances decaying to Kpipi. The decays of these resonances themselves exhibits a resonant structure, with contributions from K*pi, Krho and a (Kpi) S-wave. In the present analysis, we extract information about the Kpipi resonant structure by means of an amplitude analysis of the Kpipi and Kpi invariant mass distributions in B+ -> K+pi-pi+ gamma decays. The results are used, assuming isospin symmetry, to extract the mixing-induced CP parameters of the process B0 -> K0S rho0 gamma from the time-independent analysis of B0 -> K0S pi+ pi- gamma.

Summary

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