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Implications of the B-Mesogenesis on the Phenomenological Observables of B Mesons

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The aim of our work is to explore the implications of the Baryogenesis model, which is based on the B-Mesogenesis paradigm proposed by G. Elor, M. Escudero, and A. E. Nelson, on the phenomenological observables of the Bmeson. Specifically, we focus on analyzing the non-standard decay channels of the B-meson into a SM baryon and a dark sector antibaryon, which were proposed by the model to address the problems of matter-antimatter asymmetry and the origin of dark matter in the Universe. Building upon recent work by Alonso-Álvarez, G. Elor, M.Escudero [PRD 104, 035028 (2021),arXiv:2101.02706], where the model is further scrutinized, we employ the Heavy Quark Expansion (HQE) framework to investigate the contributions of these new decay channels to the ratio $(B+)/ (Bd)$ as well as to mixing observables, such as M_{12} , a_{sl} , and a_{sl} , in the B systems.

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