

## Light Dark Matter Contribution to Lifetime Difference of Heavy Neutral Mesons

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Heavy meson decays with missing energy in final state offer interesting avenues to search for light dark matter (DM) particles. In this context, we show that such DM interactions also affect lifetime difference in neutral meson-antimeson mixing. We consider general dimension-six effective quark interactions involving a pair of light DM fields, and calculate their contributions to lifetime difference in beauty and charm meson systems. We use the latest data on mixing observables to constrain the DM interactions under consideration. Our findings reveal that lifetime differences provide both novel and complementary flavor constraints compared to those obtained from heavy meson decays.

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