

Novel approaches to determine B^\pm and B^0 meson production fractions

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We propose novel methods to determine the $\Upsilon(4S) \rightarrow B^+B^-$ and $\Upsilon(4S) \rightarrow B^0\bar{B}^0$ decay rates. The precision to which they and their ratio are known yields at present a limiting uncertainty around 2% in measurements of absolute B decay rates, and thus in a variety of applications, such as precision determinations of elements of the Cabibbo-Kobayashi-Maskawa matrix and flavor-symmetry relations. The new methods we propose are based in one case on exploiting the $\Upsilon(5S)$ datasets, in the other case on the different average number of charged tracks in B^\pm and B^0 decays. We estimate future sensitivities using these methods and discuss possible measurements of f_d/f_u at the (HL-)LHC.

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