

Oscillations of B_s^0 mesons as a probe of decays with unreconstructed particles

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Many heavy-flavour measurements involve studies or searches for decays of hadrons into final states with neutral particles that are difficult or impossible to reconstruct with collider detectors, such as neutrinos, neutrons, K_L^0 mesons, or various dark-matter candidates. These decays are difficult to deal with, especially in the hadronic environment, such as at LHCb.

We propose a novel technique that uses B_s^0 oscillations as a tool to study B_s^0 decays with invisible (unreconstructed) particles. When combined with the information about the topology of the decay, high-frequency B_s^0 oscillations provide a strong kinematic constraint on decays with invisible particles and suppresses any non- B_s^0 backgrounds. Contrary to other methods involving topological reconstruction at LHCb, where assumptions are needed on the mass of the missing particle, this technique provides the information about the mass (or even the spectrum of invariant masses) of the invisible state(s).

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Secondary track (number)

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