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Search for a light dark sector particle at LHCb

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There is strong evidence that the Standard Model of particle physics is incomplete. The lack of evidence for any new particles had renewed interest in theories postulating the existence of a Dark Sector. The precise manifestation of these particles is entirely unknown, but at low masses a dominant decay channel would be into a dimuon pair. To that end, a search for a dark sector particle, χ , is performed by studying the decay $B^0 \rightarrow K^*(892)^0 \mu^+ \mu^-$ and $B^+ \rightarrow K^+ \mu^+ \mu^-$ for candidates consistent with $\chi \rightarrow \mu^+ \mu^-$.

Limits on the branching fraction of both decay modes are set, as functions of both the mass and χ lifetime, in a fully frequentist manner.

Oral or Poster Presentation

Oral

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