

Searches for light dark sector mediators at Belle II

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How can a dedicated flavour physics experiment aid the search for physics beyond the standard model?

Light dark sectors in the MeV—GeV mass range have seen a rise in attention in recent years.

The Belle II experiment at the asymmetric electron-positron SuperKEKB collider in Tsukuba, Japan, has unique sensitivity to a broad class of models that postulate the existence of light dark sectors.

This talk highlights the capabilities of Belle II to perform direct searches for light mediator particles that could yield a connection between the standard model and dark sectors. Several recent world-leading physics results from Belle II will be presented. Amongst others searches for Z' bosons in different final-states, as well as for lepton-flavour-violation in the decays of tau-leptons. Furthermore, the first search for long-lived mediators at Belle II will be presented, which focusses on spin-0 extensions using several production and decay modes, covering a wide range of possible lifetimes. In addition, near-term prospects for other dark sector searches will be discussed.