

## Dark Z boson and the W boson mass anomaly

*Thursday, 15 June 2023 17:30 (20 minutes)*

The dark Z boson is a new vector particle induced by an additional Abelian gauge symmetry. It interacts with the SM fermions via kinetic and mass mixings and provides a new source of parity violation. It is known that such a parity-violating effect can be tested by future precious measurements of the weak mixing angle at low energies. In this talk, we discuss the effect of the dark Z boson on the W boson mass measurement. Mixings between dark Z and the electroweak gauge bosons induce deviations in the SM gauge couplings, and it gives a possibility of explaining the W boson mass anomaly reported by the CDF collaboration. We will show that the dark Z model can explain the W boson mass anomaly with satisfying other experimental constraints within  $2\sigma$ , while simple dark photon models cannot. We also discuss how to verify such a dark Z boson in future experiments.

### Secondary category for the parallel session (optional)

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**Session Classification:** Parallel: BSM Theories and Flavor Physics

**Track Classification:** Parallel Sessions: BSM Theories