

# DPF-PHENO 2024

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## Dark photon and dark Z mediated B meson decays

*Thursday 16 May 2024 14:00 (15 minutes)*

We study flavor changing neutral current decays of B and K mesons in the dark U(1)D model, with the dark photon/dark Z mass between 10 MeV and 2 GeV. Although the model provides an improved fit (compared to the standard model) to the differential decay distributions of  $B \rightarrow K^{(*)}l+l^-$ , with  $l = \mu, e$ , and  $B_s \rightarrow \phi\mu+\mu^-$ , the allowed parameter space is ruled out by measurements of atomic parity violation,  $K^+ \rightarrow \mu^+ + \text{invisible}$  decay, and  $B_s - \bar{B}_s$  mixing, among others. To evade constraints from low energy data, we extend the model to allow for (1) additional invisible ZD decay, (2) a direct vector coupling of ZD to muons, and (3) a direct coupling of ZD to both muons and electrons, with the electron coupling fine-tuned to cancel the ZD coupling to electrons via mixing. We find that only the latter case survives all constraints.

### Mini Symposia (Invited Talks Only)

### Plenary (Invited talks only)

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