

Abstract Submitted
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Searching for Dark Forces at ARIEL¹ ROSS CORLISS, CFNS, Stony Brook University, DARKLIGHT COLLABORATION — In addition to cosmological motivations, anomalies in precision nuclear and atomic measurements have prompted standard model extensions in the form of Dark Photons or, more generically, a new force-carrier. Experimental searches have probed the parameter spaces where the simplest models predict such particles, but so far no culprit has been found and the anomalies remain unexplained. The recent report of an anomaly in ⁴He transitions, joining a similar anomaly in ⁸Be, has heightened interest in a potential new particle near 17 MeV. To reconcile this with existing searches, the particle would need to be proto-phobic, and hence suppressed in hadronic production. Leptonic searches, such as production and decay in electron-nucleus scattering, $eX \rightarrow eXA' \rightarrow eXee^+$ can test leptonic couplings directly. The DarkLight collaboration has proposed to mount such a search in the near future at TRIUMF's ARIEL accelerator, using asymmetric spectrometers to reconstruct candidate e^+e^- pairs, which could exhaust the preferred parameter space with a relatively short running time. I will briefly review of the physics involved and introduce this proposed experiment, as well as prospects to search for new, MeV-scale forces beyond this anomaly region in the future.

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