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Kaon production in LDMX

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In this talk, we explore the production of Kaons in rare photonuclear (PN) processes in the Light Dark Matter Experiment (LDMX). LDMX uses electron fixed-target reactions to search for light dark matter in the sub-GeV region with a missing momentum technique. PN processes, where a hard bremsstrahlung photon undergoes a photo-nuclear reaction in the target, are a challenging background for LDMX since they can produce single particles, such as Kaons, that carry most of the photon's energy and later decay into semi-visible signatures. In this study, we explore the rates and kinematics of visible decays of PN Kaons in different regions of parameter space. We then estimate the capability of LDMX to reconstruct these decays and use these to estimate the rate of semi-visible PN decays, such as those originated from K-long and charged Kaon decays.

Primary author: GREENSTEIN, Chloe

Presenter: GREENSTEIN, Chloe

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