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Light-shining-through The Dark Side of the Moon

Thursday 29 September 2022 14:00 (15 minutes)

The dark photon (DP) is a simple and well-motivated candidate for BSM physics. For keV masses or lighter, the sun can potentially produce a large flux of these particles which can be searched for by so-called helioscopes. In this talk, I will discuss the impact of the angular and spectral distribution of solar DPs on these searches. Considering calibration images of the HINODE XRT solar x-ray telescope one can use its precise angular resolution to improve on previous helioscope analysis techniques which were based on pure event counting. I will show that the use of the additional information can boost the constraints by around one order of magnitude. For this, I will also briefly discuss a reevaluation of the literature results on the angular distribution of DPs. Furthermore, I will comment on the use of solar eclipses as exceptionally large helioscopes. Due to the small exposure, these constraints cannot compete with the current searches of transversal DPs and they require a more sophisticated background modeling due to the pollution by real solar x-rays from the corona.

Summary

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