

# Sequential freeze-in of light dark matter and its possible probes

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We consider a light non-thermal dark matter (DM) model that interacts with the Standard Model (SM) through a light mediator. The observed relic abundance in the Universe is obtained through the sequential freeze-in mechanism, where DM is produced from pair annihilation of mediator particles which are themselves produced by thermal collisions of SM particles. The light mediator, having leptonic as well as hadronic couplings, can be probed by several low-energy experiments. We extend the previous analysis in this regard and focus on the complementarity between direct detection and new probes like atomic spectroscopy. The relevant present and future constraints are incorporated systematically in the analysis.

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