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Mono-X Signals from Initial States and Decays

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Mono-X processes provide promising channels for DM searches at the LHC. Two types of topologies for these processes are initial state X-radiation and decays in the final state. For ISR, I will consider a Z'-mediator toy model and argue that mono-jet is the most promising ISR channel. This motivates studying final state decays for mono-Z, mono-h, and di-h processes. To this end, I will use the MSSM as a WIMP framework. In particular, I will focus on how these processes are constrained by direct detection and the DM relic abundance. Thereby, I will argue that direct detection limits favor di-h over mono-h. I will further show how these constraints can be ameliorated in the NMSSM. Finally, I will compare our findings to existing EFT results.

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