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Production mechanisms for sterile neutrino Dark Matter

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Given the absence of a clear WIMP signal, we have to seriously investigate alternative Dark Matter (DM) candidates. Sterile neutrinos with a mass of a few keV are such an alternative, which have to be produced in the early Universe by a mechanism different from ordinary thermal freeze-out.

After an introduction to the topic, I will review the different proposals on the market for sterile neutrino DM production mechanisms and will show how non-trivial the resulting velocity distributions can be. I will touch on how to use the non-trivial DM spectra to possibly attack the known small scale structure formation problems of cold DM.

In general, I will give you the reasons at hand why sterile neutrino DM is not an exotic outsider view, but rather a serious alternative to WIMPs, which we will need to investigate with full force in case WIMP detection attempts keep on not delivering a clear picture.

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