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Analysis of the WIMP, SIMP and FIMP mechanisms of dark matter production in the early universe

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We present an analysis of the mechanisms of dark matter production in the early universe. There are many different models that try to explain such production. In this short talk we focus on three of these mechanisms. The first and the most recognized is the Weakly Interacting Massive Particles or WIMP model, which we work on by applying the Boltzmann equation to study the behavior of the WIMP relics in the thermal bath in the early universe. This analysis is done by finding an approximate solution of the equation analytically, and then numerically, using Python programming. We then use this same process adapting the calculations to characterize the Feebly Interacting Massive Particles or FIMP and Strongly Interacting Massive Particles or SIMP.

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