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Gravitational particle production and dark matter

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In the purely gravitational dark matter scenario, the dark matter particle does not have any interaction except for gravitational one. We study the gravitational particle production of dark matter particle in such a minimal setup and show that correct amount of dark matter can be produced depending on the inflation model and the dark matter mass. In particular, we carefully evaluate the particle production rate from the transition epoch to the inflaton oscillation epoch in a realistic inflation model and point out that the gravitational particle production is efficient even if dark matter mass is much larger than the Hubble scale during inflation as long as it is smaller than the inflaton mass.

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