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Gravitational particle production after Reheating

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Due to change of space-time during Inflation and Reheating, spectators field present during these epochs are going to be excited. This can be seen as a particle production.

I am going to present the production of a field with no coupling to any other field, the only possible way of interaction will be through gravity.

Some problems will arise due to the divergences present in this model and I will show how to deal with them and how to obtain the abundance of this particle today.

If this is the method to produce the dark matter abundance today, some bounds can be imposed on the mass of Dark matter and the energy scale of Inflation and Reheating.

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