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Axino and gravitino dark matter with low reheating temperature

Thursday 23 July 2015 15:00 (15 minutes)

Possible discovery of supersymmetric particles in the second run of the LHC accompanied by lack of observation of a dark matter particle in direct searches may point towards dark matter candidates being extremely weakly interacting particles with supersymmetric origin. In this talk I will focus on two such candidates that are well motivated theoretically, namely the axino and the gravitino. In particular I will discuss the upper limit on the axino mass assuming that it is the dark matter particle. This issue can be properly treated when low reheating temperature of the Universe after a period of cosmological inflation is taken into account. I will discuss how both thermal and non-thermal production of axino is modified in this regime and how this influences the aforementioned upper limit on the axino mass. I will also discuss constraints on such scenario that could be derived from a possible detection of supersymmetric particles at the LHC and from the Big Bang Nucleosynthesis and Large Scale Structure formation. Similar analysis in the case of gravitino dark matter leads to a lower limit on the reheating temperature in this scenario as will be shown.

additional information

Talk will be partly based on JHEP 1411 (2014) 146 (hep-ph/1406.0012) and partly on the other project done in collaboration with L. Roszkowski and K. Turzynski (in progress).

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