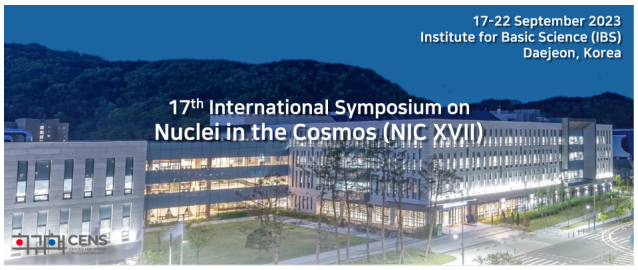

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The role of Majorons on big bang nucleosynthesis

Friday, September 22, 2023 11:30 AM (15 minutes)

The Majoron, the Goldstone boson from the spontaneous lepton number symmetry breaking, is a theoretically and phenomenologically well-motivated hypothetical particle. As it is typically believed to be long-lived, it has the potential power of altering the big bang nucleosynthesis.
We find that non-thermal energetic neutrinos produced by decays of Majoron can cause various neutrino-induced nuclear reactions, providing additional neutrons from the inverse beta decay. It is of great interest to see whether such reactions can boost the reactions such as 7Be(n,p)7Li and 7Li(p,\alpha)4He processes, resolving the long-standing discrepancy between the observed abundance and the theoretical prediction of 7Li. Stating differently, the big bang nucleosynthesis can constrain the values of the parameters of the Majoron. These questions are addressed in our work by studying the effect of the Majoron on the big bang nucleosynthesis.

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