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A late baryogenesis in an ekpyrotic-like universe with a hidden CP violation

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Two-brane universes are among the cosmological models of interest such as ekpyrotic models. It is then a major concern to constrain these scenarios. In the last two decades, it has been theoretically demonstrated that matter exchange between branes can occur and can be a way to test these scenarios. Thus, neutron disappearance (reappearance) toward (from) a hidden brane has been recently tested with short-baseline reactor experiments (MURMUR, STEREO) used as competitive passing-through-walls neutron experiments to search for hidden neutrons. Here, we introduce an ekpyrotic-like model in which the matter (respectively antimatter) of our brane is coupled with the matter (respectively antimatter) of the hidden brane. However both couplings are supposed to break the CP invariance through the bulk thus leading the baryogenesis to occur lately after the electroweak epoch. The theoretical and experimental outcomes, and issues of such an approach are discussed.

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