

Cosmological limit on the size of extra dimensions

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There are two main processes during inflation - quick space expansion and grows of the field energy due to fluctuations. In simplest and most widespread realization of the inflationary scenario, only one dimensional parameter plays essential role - the Hubble parameter H . If a compact space is involved into consideration, another dimensional parameter - an extra space size l - appears. There are two opposite cases $l \gg H^{-1}$ and $l \ll H^{-1}$. The second case is not very interesting because the Kaluza-Klein excitations are too massive to be excited during the inflation. Much more promising is the first case which leads to the energy storage "inside" the extra space in the form of its fluctuations. It will be shown here that the first case contradicts observations. Therefore the size of extra dimensions should be smaller than 10^{-27} cm.

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