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Big Bang Nucleosynthesis of ^{6}Li and ^{7}Li[1] GRANT MATHEWS, UND, MOTOHICO KUSAKABE, TOSHITAKA KAJINO, TAKAHASHI YOSHIDA, NAOJ, RICHARD BOYD, LLNL — The ^{6}Li abundance observed in metal poor halo stars exhibits a plateau similar to that for ^{7}Li suggesting a primordial origin. However, the observed abundance of ^{6}Li is a factor of 10^3 larger and that of ^{7}Li is a factor of 3 lower than the abundances predicted in the standard big bang when the baryon-to-photon ratio is fixed by WMAP. Here we show that both of these abundance anomalies can be explained by the existence of a long-lived massive, negatively-charged leptonic particle during nucleosynthesis. Such particles would capture onto the newly synthesized nuclei thereby reducing the reaction Coulomb barriers and opening new transfer reaction possibilities, which catalyze a second round of big bang nucleosynthesis. This novel solution to both of the Li problems can be achieved with or without the additional effects of stellar destruction.

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