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A Survey of Big Bang-era Nuclear Reactions ZACHARY NABOR, CLAUDIO UGALDE[1], Univ of Illinois - Chicago — In the earliest moments of the Big Bang, an enormous portion of the light elements that exist today (hydrogen, helium, deuterium, lithium) where produced by a mechanism called Big Bang nucleosynthesis (BBN). This model is successful for matching theoretical predictions to observed abundances. However, BBN isnt without its own shortcomings. In particular, BBN makes predictions of higher abundances for lithium than the ones obtained from actual astronomical observations. Using ALTERBBN, a computational program of BBN, and experimental reaction rates, we are studying the influence of nuclear reaction rates during BBN (around 1-100 gigakelvin), and how these reactions influence the abundances of light elements produced during the Big Bang. The analysis examines the responses of elemental abundances due to changes in nuclear reaction rates. Of particular interest, we will examine closely those rates that lead to a lower abundance of lithium isotopes. First simulations of the nuclear reaction $^3He(\alpha,\gamma)^7Be$ have yielded decreases in lithium abundances without significant alterations to the abundances of other light elements. The behavior of this reaction will be the primary investigation.

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