Abstract Submitted
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A Theoretical Model of the Role of Dark Matter in Nucleosynthesis.[1] RUBEN RIVERA, AJIT HIRA, JOSE PACHECO, JAMES MCKEOUGH, Northern New Mexico College, EDWARDINE FERNANDEZ, Espanola Health Services, TOM ABBOTT, Retired — The recent reports on the refinements in the experimental methods for detecting gravitational waves, and on the data thus made available, are opening up new vistas in Astrophysics research and in Particle Physics research. This is the main motivation for the research on the role of Dark Matter (DM) in the nucleosynthesis of heavy elements, such as gold, lead and others, in the universe presented in this paper. Our study refines the computational methods previously used for the study of nucleosynthesis, and extends the methodology. Our computer codes utilize C++ and MATLAB languages, and combine the formalisms of Feynman Path Integrals (FPI), Monte-Carlo Theory (CMT) and Energy Group Methods (EGM). One main component of our study is the impact of Dark Matter candidates of mass in the MeV range on the Big Bang Nucleosynthesis (BBN). Our simulations also attempt to address the possibility of the decaying Dark Matter particles being the source of the positrons which have been proposed to explain the experimentally-observed 511 keV gamma ray signatures. Future observations using gravitational waves should test the validity of our model and of these results.

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