Abstract Submitted
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Ameliorating Computational Tools and Testing Cosmological Models EZEKIEL SHULER[1], Francis Marion University — The Lambda-Cold Dark Matter (LCDM) model is the standard model for the universe. This model explains some key elements in the universe that cosmologists believe to be true, however this model also has some inconsistencies. Using the CosmoMC code along with the Palmetto Cluster, I will run jobs that will best test the LCDM model. I will also improve an EJS (Easy Java Simulations) program to require GRBs (Gamma-Ray Bursts) as apposed to just SN (Supernovae). Supernovae Type Ia are known as standard candles, and they are used to directly probe the expansion rate of the universe. Recently, GRBs (Gamma-Ray Bursts) have been explored more and have been proposed to be a complementary probe to Supernovae Type Ia. So far, GRBs are the most intense explosions in our universe. For this reason, the GRBs have much higher redshifts up to 8.1, but redshifts close to 10 or larger are expected. This simulation allows the user to discover the cosmological model that best-fits the recent supernovae and GRB datasets. After receiving the results from my jobs on the Palmetto cluster, I will conclude on the stasis of the LCDM model and be able to do a pulmonary test with the GRBs in the EJS program. I found that the LCDM model is a pretty good model for our universe, but we need more conclusive data to rule it out or keep it. The study of the evolution of the universe is extremely important to understand the cause of the accelerated expansion of the universe (cosmic acceleration).

[1]Undergraduate Poster Presentation

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