Conclusion

In this study, twelve galaxies greater than 15 MLY away from earth were surveyed for WIMP dark matter content. The identity of dark matter and its particle composition remain one of the biggest mysteries in the universe. Majorana Weakly Interacting Massive Particles serve as a primary candidate for dark matter, as their relic annihilation cross-section aligns with that of the relic cross-section of dark matter, and consequently are considered a primary candidate for the unseen matter. This experiment detects and analyzes the gamma rays emitted from WIMP annihilation within astrophysical phenomena. Distant galactic sources were chosen for this study to compound previously collected data on local dwarf spheroidal galaxies and offer a new class of objects for dark matter analysis. The annihilation cross section and the significance of the dark matter signal were mapped out over dark matter masses from 10 GeV and 5 TeV. No statistically significant dark matter signal was detected, with TSmax = XYZ for …. Additionally, the cross-section for dark matter masses is less than the relic cross-section below 100 GeV for the bb uu and tau-tau channels, thus limiting the dark matter mass above these values. From 100 GeV to 5 TeV, the upper confidence interval on the cross-section for all channels excluding bb was lower than that of previously collected survey data, thus constraining the cross-section. Due to the variability in the test statistic and the lack of kinematically derived J-factors, these sources should not be considered optimal candidates for dark matter surveys. Future dark matter surveys must be able to derive more extensive characteristics from the chosen regions of interest to limit the uncertainty tied to their measurements and to offer definitive constraints on WIMP dark matter.