

"Searching for RR Lyrae Variables in the Dark Energy Survey"

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RR Lyrae variables are stars with a characteristic relationship between magnitude and phase and whose distances can be easily determined, making them extremely valuable in mapping and analyzing galactic substructure. We present our method of searching for RR Lyrae variable stars using data extracted from the Dark Energy Survey (DES). The DES probes for stars as faint as $i = 24.3$. Finding such distant RR Lyrae allows for the discovery of objects such as dwarf spheroidal tidal streams and dwarf galaxies; in fact, at least one RR Lyrae has been discovered in each of the probed dwarf spheroidal galaxies orbiting the Milky Way (Baker & Willman 2015). In turn, these discoveries may ultimately resolve the well-known missing satellite problem, in which theoretical simulations predict many more dwarf satellites than are observed in the local Universe. Using the Lomb-Scargle periodogram to determine the period of the star being analyzed, we could display the relationship between magnitude and phase and visually determine if the star being analyzed was an RR Lyrae. We began the search in frequently observed regions of the DES footprint, known as the supernova fields. We then moved our search to known dwarf galaxies found during the second year of the DES. Unfortunately, we did not discover RR Lyrae in the probed dwarf galaxies; this method should be tried again once more observations are taken in the DES.