Systematic Differences in the Calculation of Stellar Mass for ALFALFA Galaxies ()

Burhenne, Clare (*Astronomy Department, Cornell University, Ithaca, NY, United States*)

To create a Baryonic Tully-Fisher Relationship (BTFR) for the ALFALFA galaxies, we require a corresponding catalog of optical photometry to produce reliable stellar masses to complement their HI masses. Different methods of calculating stellar mass have been used in derivations of the BTFR depending on the sky distribution, prior redshift information or multiwavelength photometry of the sample galaxies. In order to obtain stellar masses for all of the ALFALFA galaxies in the SDSS photometric footprint, we use a crossmatch file between the α-100 catalog and the SDSS DR14 database to produce a reliable catalog of optical photometric properties for use in the stellar mass calculation and inclination-dependent corrections. For the stellar masses, we use the methodology set forth in Taylor et al. (2011), specifically, the modeled mass to light ratio estimated from the g-i color index. In order to compare stellar masses derived in this way with results obtained by other authors in the literature who used Petrosian and Sersic masses available in the NASA Sloan Atlas (NSA) to derive stellar masses, we investigate the differences in stellar mass and the corrections for inclination and extinction between values complied in the NSA and ones obtained using our α-100-SDSS cross-match. We investigate systematic differences in stellar mass estimates based on photometric properties such as color, surface brightness and concentration and on others such as distance, velocity width and HI richness. This research is supported by the Brinson Foundation for the Arecibo Pieces-Perseus Supercluster Survey (APPSS) and NSF grant NSF/AST-1714828 to M.P. Haynes.

Publication:
American Astronomical Society, AAS Meeting #233, id.162.05

Pub Date:
January 2019

Bibcode:
2019AAS...23316205B