Faint NUV/FUV Standards from Swift/UVOT, GALEX and SDSS Photometry

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At present, the precision of deep ultraviolet photometry is somewhat limited by the dearth of faint ultraviolet standard stars. In an effort to improve this situation, we present a uniform catalog of eleven new faint (u sim17) ultraviolet standard stars. High-precision photometry of these stars has been taken from the Sloan Digital Sky Survey and Galaxy Evolution Explorer and combined with new data from the Swift Ultraviolet Optical Telescope to provide precise photometric measures extending from the Near Infrared to the Far Ultraviolet. These stars were chosen because they are known to be hot (20,000 < T_eff < 50,000 K) DA white dwarfs with published Sloan spectra that should be photometrically stable. This careful selection allows us to compare the combined photometry and Sloan spectroscopy to models of pure hydrogen atmospheres to both constrain the underlying properties of the white dwarfs and test the ability of white dwarf models to predict the photometric measures. We find that the photometry provides good constraint on white dwarf temperatures, which demonstrates the ability of Swift/UVOT to investigate the properties of hot luminous stars. We further find that the models reproduce the photometric measures in all eleven passbands to within their systematic uncertainties. Within the limits of our photometry, we find the standard stars to be photometrically stable. This success indicates that the models can be used to calibrate additional filters to our standard system, permitting easier comparison of photometry from heterogeneous sources. The largest source of uncertainty in the model fitting is the uncertainty in the foreground reddening curve, a problem that is especially acute in the UV.

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