Multi-survey and Statistical Methods for Cool White Dwarf Discovery

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Compiling astrometric and photometric data from the Sloan Digital Sky Survey (SDSS), Lepine & Shara Proper Motion North Catalog, and the Two Micron All Sky Survey (2MASS), we explore a succession of methods to isolate white dwarfs (WDs) within subdwarf-dense parameter spaces. We utilize reduced proper motion cuts, color cuts, and atmospheric modeling to identify new WDs candidates for spectroscopy. By pooling data from our ongoing spectroscopic observations, targets found in the SDSS spectra database and various WD catalogs in the literature, we are exploring ways to further enhance our methodology. In this regard, principal component analysis (PCA) and linear discriminant analysis (LDA) techniques are being used as a means to better separate WDs from subdwarfs where customary photometric and astrometric analyses alone are largely ambiguous.