Automated Spectral Classification and the Search for Variable White Dwarfs

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White dwarf stars exhibiting pulsational variability are one of the most important astrophysical tools for exploring the inner composition and atmospheric structure of degenerate stars. The variable DA, or ZZ Ceti stars, are also crucial in testing the models for convective energy transport in the atmospheres of cool hydrogen-rich white dwarfs. Only 31 of these pulsators are known to date.

We present results of an automated spectral classification of digitized photographic spectra from the Hamburg Quasar Survey. Parameters derived from fitting to a large grid of theoretical spectra are used to select hot stars with high gravity, in particular white dwarfs, and to estimate their effective temperature. These results can be used to identify cool DA white dwarfs close to the temperature range of the ZZ Ceti strip. Approximately 900 DA candidates with $10\,000\,\mathrm{K} < T_{\mathrm{eff}} < 14\,000\,\mathrm{K}$ have been found, most of them not previously known.

Additional follow-up spectroscopy at higher resolution and good S/N is required to confirm the white dwarf nature of these objects and get accurate determinations of their atmospheric parameters that will allow an efficient selection of variable DA. Our sample has the potential to at least double the number of known DAV and also improve the knowledge of their mass distribution and exact location of the ZZ Ceti stars in the $\log g - T_{\mathrm{eff}}$ plane.