# Results From a MIKE Spectroscopic Monitoring Campaign of DAZs


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## Abstract

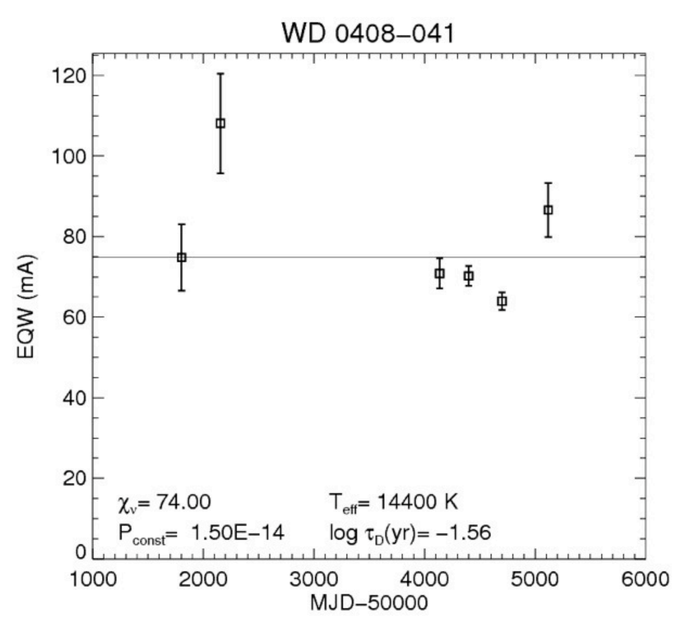
The MIKE optical spectrograph on the Magellan Telescopes is a powerful instrument for detecting and monitoring the faint metal lines present in nearby metal enriched white dwarfs. With a spectral resolution of ~30,000 and spectra with S/N>20 that cover from 3500Å to 9500Å, we can both monitor the Ca H and K lines as well as search for other metal lines of Mg and Fe. We present monitoring of 30 southern DAZs for variability in their Ca H and K lines, presenting some of our strongest candidates for variability . In addition to these white dwarfs, we have searched other white dwarfs for evidence of metal line absorption. We have also discovered two new DAZs within 20 pc, and a double degenerate that will merge within 1 Gyr.

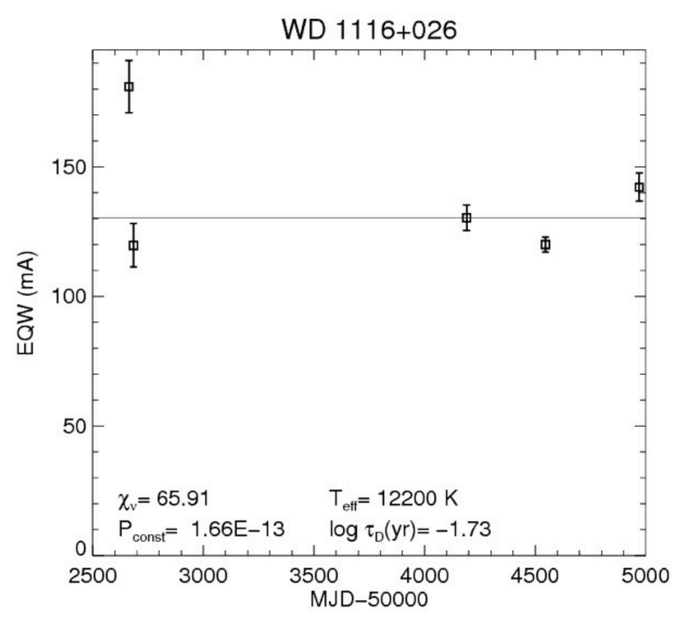

| Name | $T_{eff}$ | log $\tau_D$ (yr) | $N_{obs}$ | Disk? |
|---|---|---|---|---|
| WD 0032-175 | 9235 | 2.72 | 1 | |
| HS 0047+1903 | 16600 | -1.48 | 1 | |
| HE 0106-3253 | 15700 | -1.82 | 3 | X |
| WD 0141-675 NEW! | 6577 | 3.5 | 2 | |
| WD 0235+064 | 11420 | -1.04 | 2 | |
| WD 0243-026 | 6798 | 3.39 | 2 | |
| WD 0408-041 | 14400 | -1.56 | 4 | X |
| WD 1015+161 | 19300 | -1.59 | 2 | X |
| WD 1116+026 | 12200 | -1.73 | 4 | |
| WD 1124-293 | 9700 | 2.29 | 6 | |
| WD 1150-153 | 12800 | -1.63 | 3 | X |
| WD 1202-232 | 8800 | 2.59 | 3 | |
| WD 1204-136 | 11200 | -0.34 | 2 | |
| WD 1223-659 NEW! | 7826 | 3.13 | 2 | |
| HE 1225+0038 | 9400 | 2.48 | 2 | X |
| HE 1315-1105 | 9400 | 2.02 | 2 | |
| WD 1344+106 | 6945 | 3.68 | 2 | |
| WD 1457-086 | 20400 | -1.73 | 3 | X |
| WD 1614+160 | 17400 | -1.46 | 2 | |
| WD 1821-131 | 7029 | 2.89 | 3 | |
| WD 1826-045 | 9200 | 2.58 | 3 | |
| GALEX1931 | 20890 | -1.7 | 2 | X |
| WD 2105-820 | 10300 | 1.23 | 5 | |
| WD 2115-560 | 9700 | 2.29 | 6 | X |
| HS 2132+0941 | 13200 | -1.47 | 4 | |
| WD 2149+021 | 17300 | -1.62 | 6 | |
| HE 2221-1630 | 10100 | 1.84 | 4 | X |
| HS 2229+2335 | 18600 | -1.60 | 2 | |
| HE 2230-1230 | 20300 | -1.7 | 3 | |
| WD 2326+049 | 12100 | -1.70 | 6 | X |

Effective temperatures are from Koester & Wilken (2006), except for WD 0141-675, WD 1223-659, (Kilic et al., 2008) and GALEX1931 (Vennes et al., 2009). The calculations for $\tau_D$ are from Koester & Wilken (2006) or interpolated from Table 4 in Koester (2009).

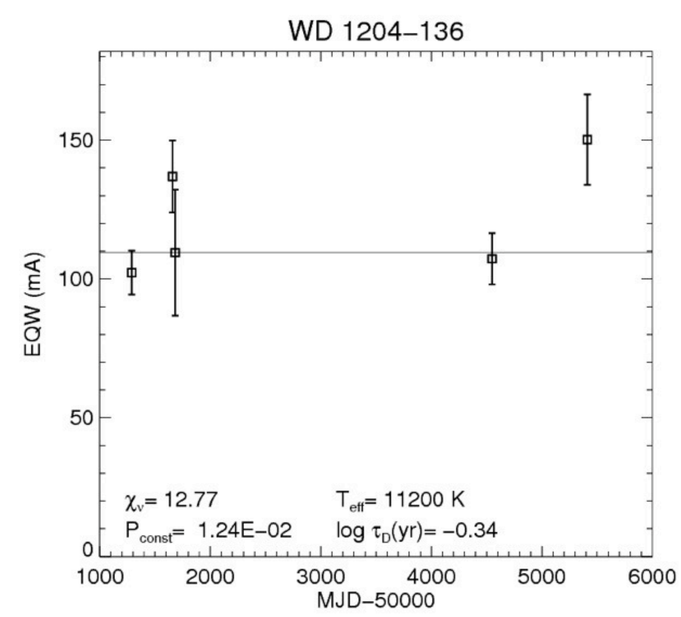
## Variable Accretion for DAZs

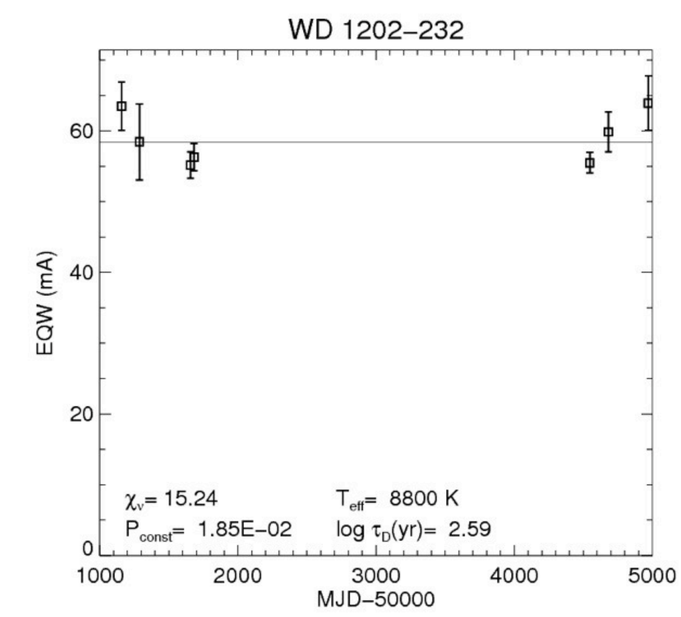
### Variable Candidates



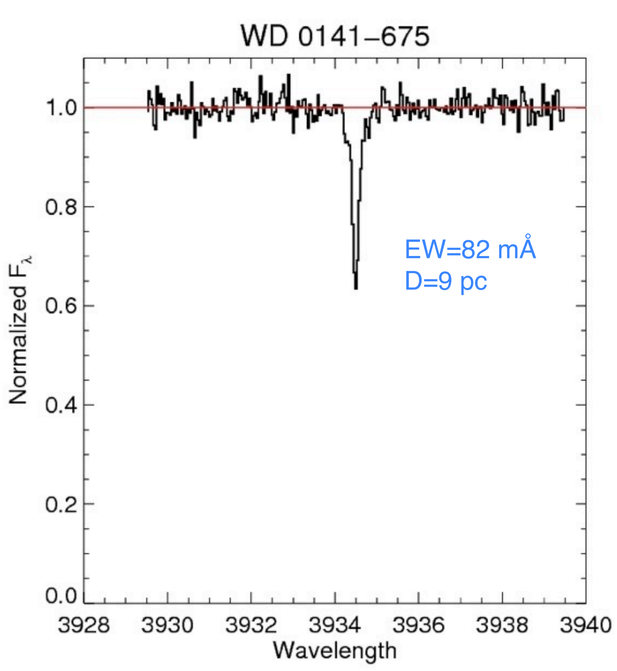

### Stable Accretion

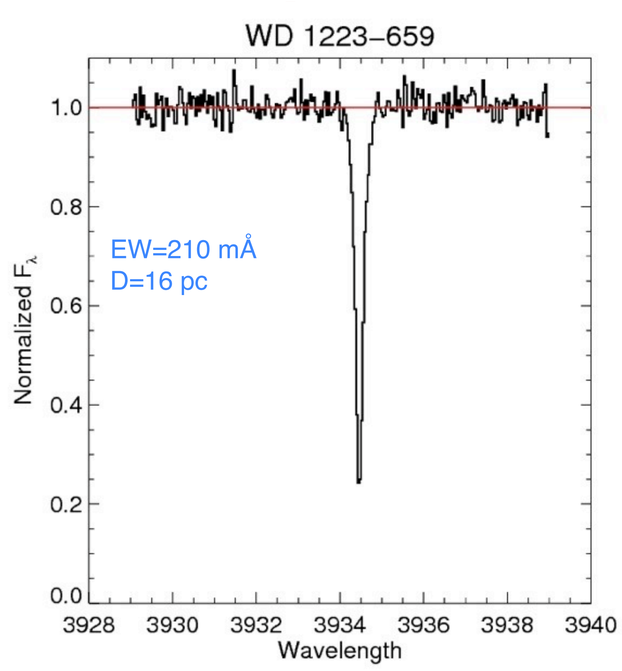


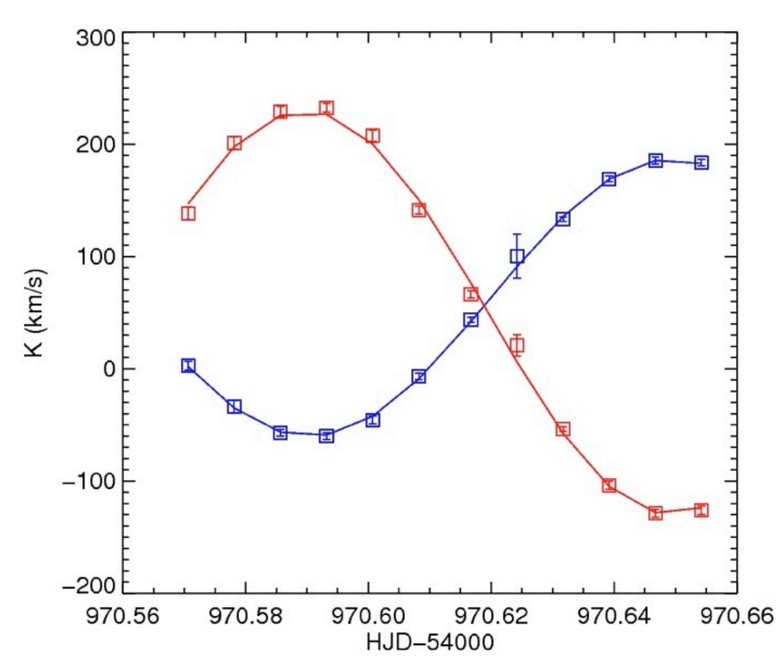

Variable Selection Criteria: $\chi_\nu$>36 for constant EW, at least 2 MIKE epochs

## New DAZs within 20 pc




## A Double Degenerate that will Merge in <1 Gyr




$K_1$=-123±1 km/s

$K_2$=180±1 km/s

P=2.85 hr

$V_1$=64±1 km/s

$V_2$=50±1 km/s

$M_1$=0.59±0.03 $M_\odot$

$M_2$=0.41±0.02 $M_\odot$

Masses were determined following the procedure of Napiwotzki et al., (2002)

$T_{merge}$=680 Myr