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ACCRETION IN DETACHED POST-COMMON-ENVELOPE BINARIES

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We present the results of a time-series spectroscopic snapshot survey of short-period post-common-envelope binaries. We find that in 6 out of 11 systems the Hα emission line profile consists of more than one component.

Close interacting binaries such as cataclysmic variables from from detached binary stars that go through a common envelope phase as the more massive star expands. During this phase the binary separation shrinks rapidly due to friction, so that the resulting post-common-envelope binary (PCEB) emerges with an orbital period in the order of one to a few days. Angular-momentum-loss mechanisms further reduce the orbital period eventually down to a semi-detached configuration, where the late-type main-sequence secondary star transfers matter to the white dwarf primary via Roche-lobe overflow.

Recently, we found the PCEB LTT 560 to present an Hα emission line that consists of two components, one from each stellar component (Tappert et al. 2007, 2011). Apparently, in this still detached system, wind accretion takes place at such a rate that it induces emission. LTT 560 inhabits a cool ($\sim$8000 K), non-magnetic white dwarf and an M5.5V secondary, that complete one orbit in 3.54 h. Apart from the low temperature of the primary star, the system therefore does not appear particularly special, which raises the question if not other PCEBs can be found that exhibit a corresponding two-component emission line profile.

We have conducted a spectroscopic snapshot survey on all at that time known PCEBs from the Sloan Digital Sky Survey with an orbital period $P_{\rm orb} < 6$ h that are accesssible from the southern hemisphere. The reason for limiting the sample to short-period PCEBs is that there is a high probability that they inhabit a mid/late M, and thus active, secondary that already fills a large part of its Roche lobe. Both factors will certainly favour an enhanced wind accretion rate. A number of ≥ 3 subsequent spectra per object were obtained with the FORS2 spectrograph mounted on UT1 at the ESO-Paranal Observatory, with a spectral resolution of 2.3 Å, and exposure times $< 0.1 P_{\rm orb}$.

TABLE 1

Object	$P_{\rm orb}$	$T_{\rm WD}$	SpT	c
J015225.38−005808.5	2.17	9	M6	m
J211205.31+101427.9	2.17	20	M6	m
J155904.62+035623.4	2.27	49	–	m
J005245.11−005337.2	2.73	16	M4	m
J030308.35+005444.1	3.20	–	M4	m
J212320.74+002455.5	3.58	13	M6	s
J152933.25+002031.2	3.95	14	M5	s
J141134.70+102839.7	4.02	30	M3	s?
J221616.59+010205.6	5.05	12	M5	m
J023804.39−000545.7	5.08	22	M3	s
J213218.11+003158.8	5.33	16	M4	s

Columns: (1) SDSS designation; (2) orbital period in h; (3) temperature of the white dwarf in 10^3 K; (4) spectral type of the secondary star; (5) (m)ultiple or (s)ingle emission line components.

Preliminary results of our survey are presented in Table 1. System parameters there are from Rebassa-Mansergas et al. (2008, 2010) and Nebot Gomez-Moran et al. (in preparation). We find unambiguous evidence for multiple Hα emission components in 6 systems, while in 4 objects only one component is present. Another PCEB, J1411, has insufficient data to definitely exclude additional components. At first glance, our initial suspicion is confirmed, in that the orbital period appears to be the most important factor, since all 5 objects with $P_{\rm orb} < 3.5$ h have multiple emission components. High resolution follow-up observations will be necessary to identify the origin of the components.

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REFERENCES

Rebassa-Mansergas, A., et al. 2008, MNRAS, 390, 1635
Rebassa-Mansergas, A., et al. 2010, MNRAS, 402, 620
Tappert, C., et al. 2007, A&A, 474, 205
Tappert, C., Gänsicke, B. T., Schmidtobreick, L., & Ribeiro, T. 2011, A&A, 532, A129