

LTT 560 and Mass Transfer in Pre-CVs

Claus Tappert

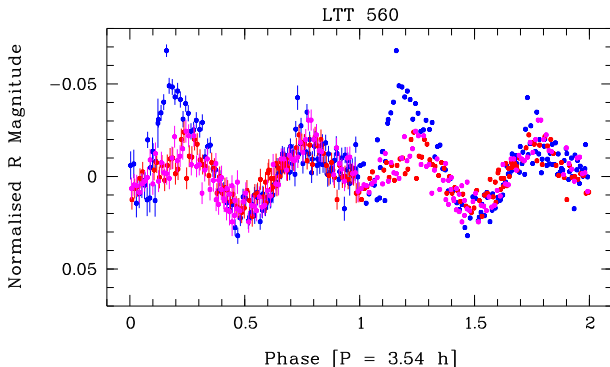
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Wild Stars in the Old West II

Partners in crime

- Boris Gänsicke, University of Warwick, UK
- Matthias Schreiber, Universidad de Valparaíso, Chile
- Linda Schmidtbreick, ESO, Chile
- Stella Kafka, Spitzer Science Center, USA
- Kent Honeycutt, Indiana University, USA

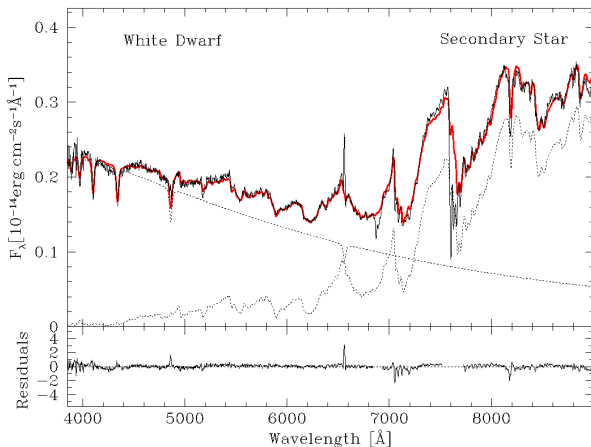
LTT 560: Photometry



- ellipsoidal variation
- $P_{\text{orb}} = 3.54 \text{ h}$
- flares

(Tappert et al., 2007)

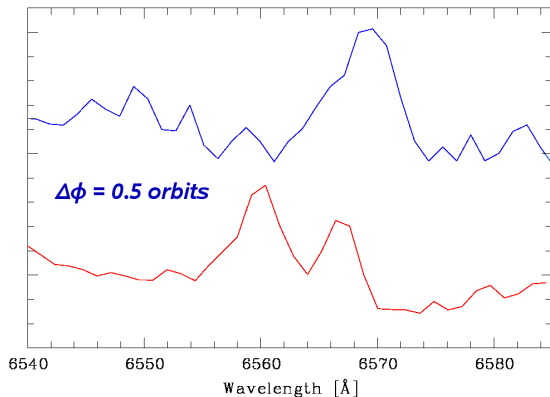
LTT 560: Spectroscopy



- $T_{\text{WD}} = 7500 \text{ K}$
- $\log g = 8.0$
- $\text{SpT}_{\text{Sec}} = \text{M5.5V}$

(Tappert et al., 2007)

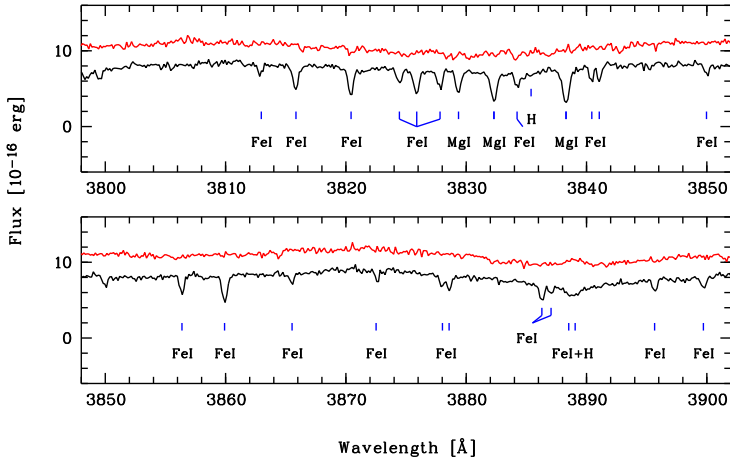
LTT 560: H α Line Profile



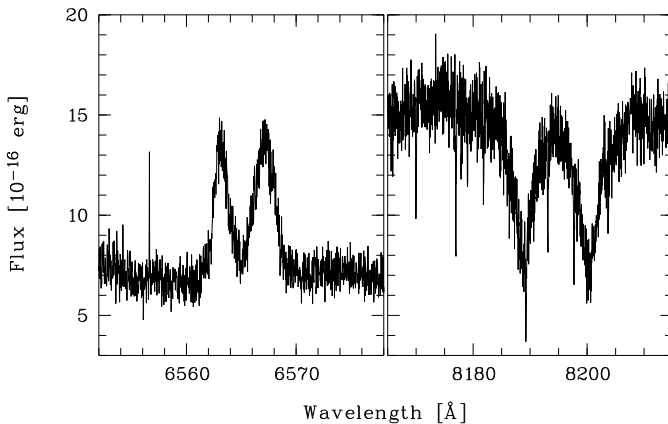
- broad + narrow component
- antiphased

(Tappert et al., 2007)

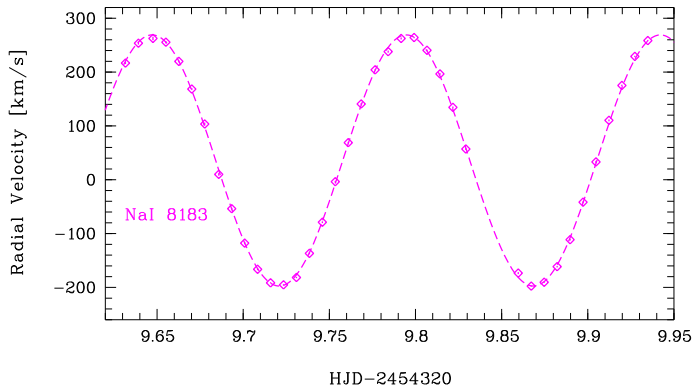
LTT 560 Echelle: Metal lines



LTT 560 Echelle: $H\alpha$ + NaI



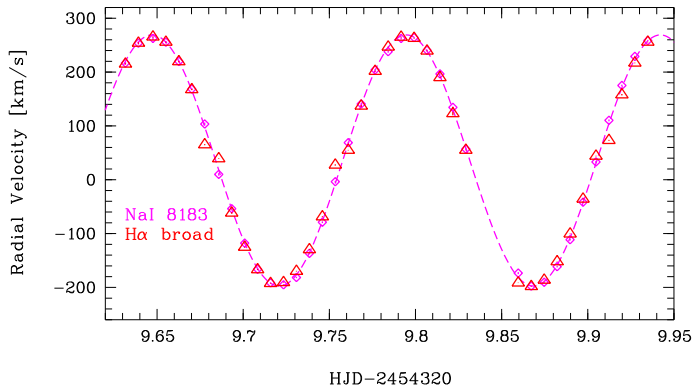
LTT 560 Echelle: Radial velocities



$$K_2 = 233 \text{ km/s}$$

$$\gamma_2 = 36 \text{ km/s}$$

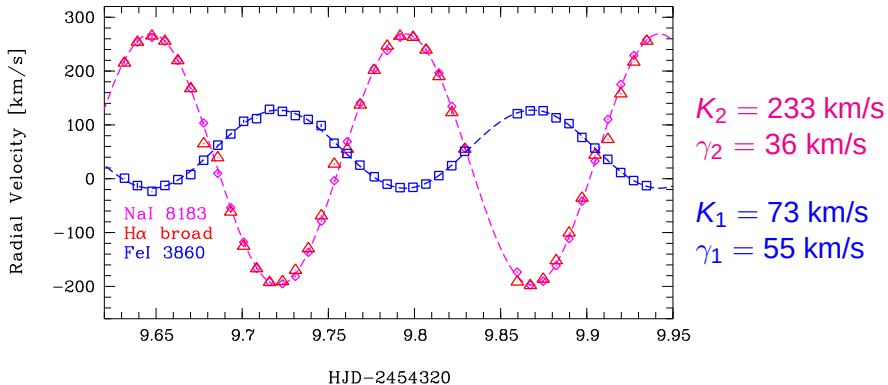
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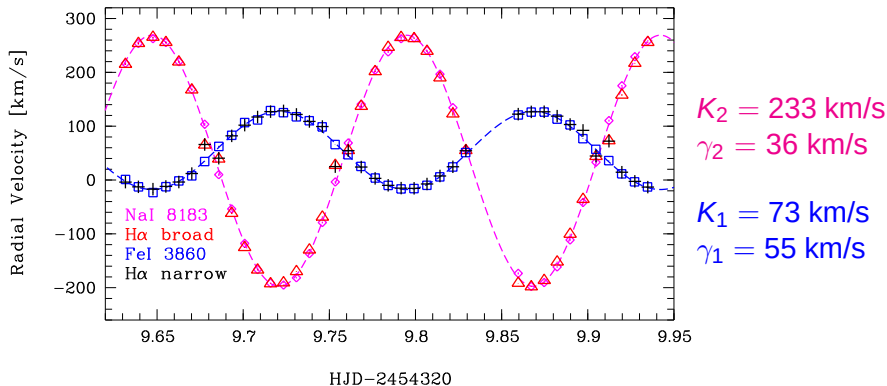
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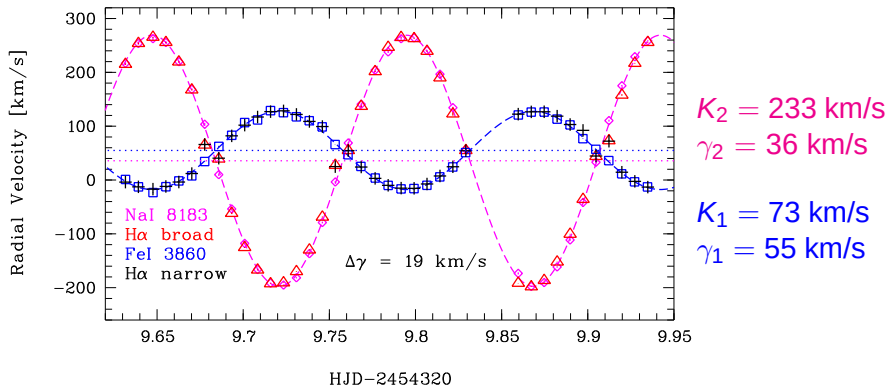
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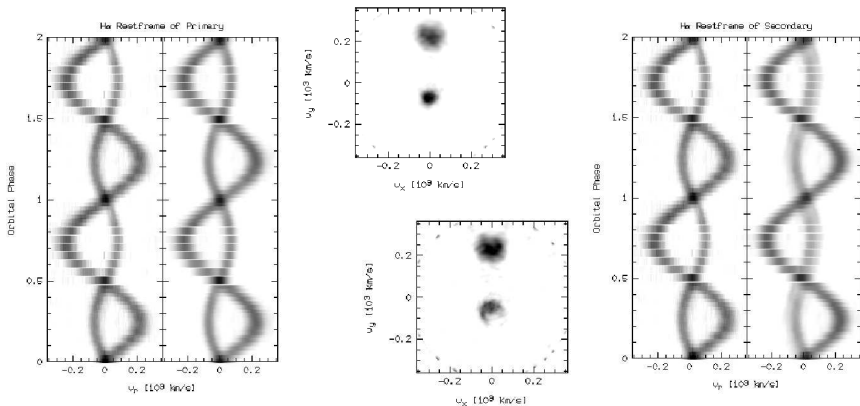
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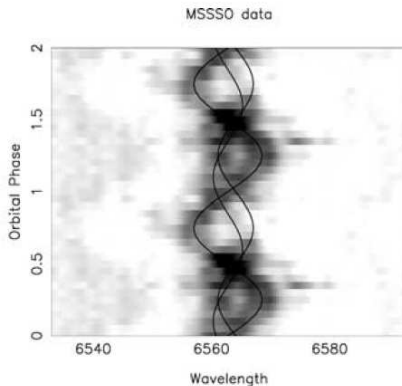
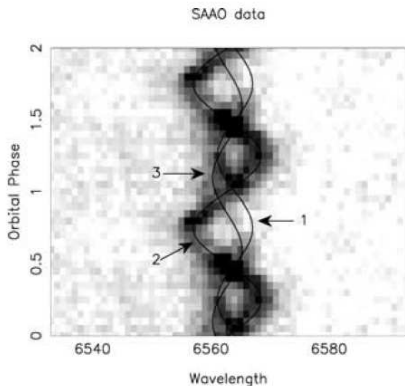


LTT 560 Echelle: Doppler Maps



EC 13471–1258

The **only** other **non-magnetic** pre-CV to show additional emission

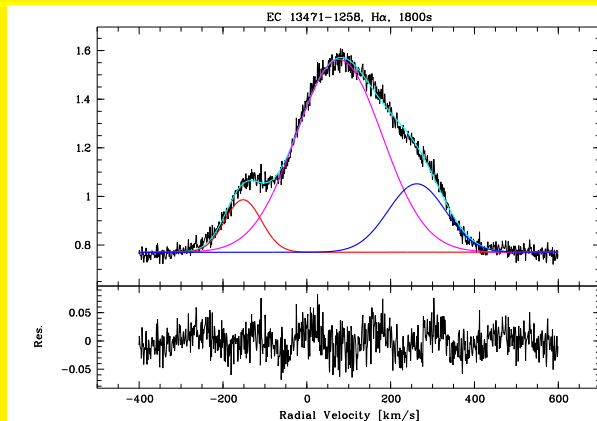
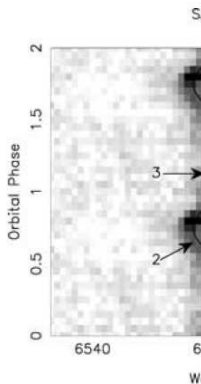


(O'Donoghue et al., 2003)

EC 13471–1258

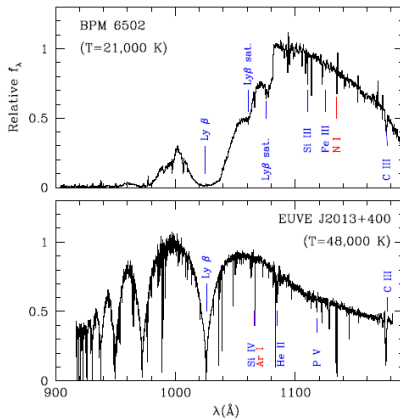
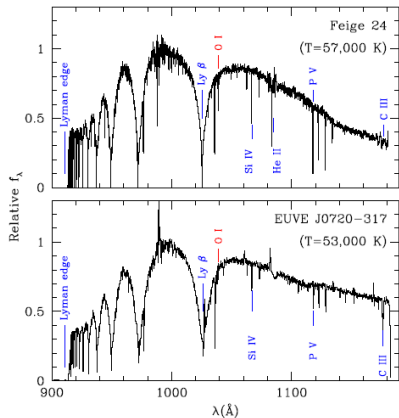
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Echelle spectrum



(O'Donoghue et al.)

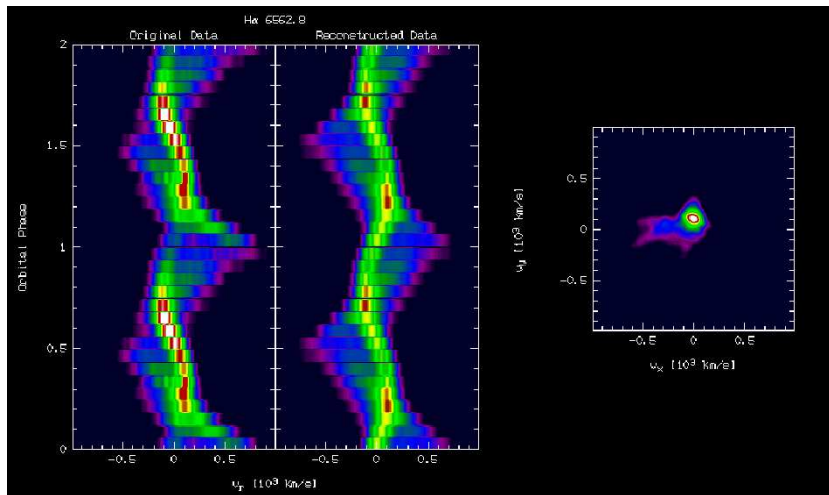
Other Non-Magnetic Pre-CVs: UV Spectra



Kawka et al., 2008: $\dot{M} = 10^{-19} - 10^{-17} M_{\odot}/\text{yr}$

Magnetic Pre-CVs?: Low Accretion Rate Polars

example J2048 (*Kafka et al., in prep.*)



Non-Magnetic Short Period Pre-CVs: Comparison

	LTT 560	EC 13471
Period [h]	3.54	3.62
Secondary	M4.5-6.5V	M3.5-4V
Primary T	7 500 K	14 220
$\log g$	8.0	8.34
$\Delta\gamma$	19	63
K_1 [km/s]	73	138
K_2 [km/s]	233	266
q	0.31	0.52
i	~ 60	75.5
H α flares	yes	yes

Non-Magnetic Short Period Pre-CVs: Comparison

	emission		no emission	
	LTT 560	EC 13471	MS Peg	BPM 71214
Period [h]	3.54	3.62	4.17	4.84
Secondary	M4.5-6.5V	M3.5-4V	M3-5V	M2.5V
Primary T	7 500 K	14 220	22 170	17 200
$\log g$	8.0	8.34	7.77	8.25
$\Delta\gamma$	19	63	?	?
K_1 [km/s]	73	138	101	(62)
K_2 [km/s]	233	266	216	124
q	0.31	0.52	0.46	(0.5)
i	~ 60	75.5	69	(30)
H α flares	yes	yes	?	?

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H α flares	yes	yes	?	?

+ NN Ser ($T_{\text{WD}} = 57\,000$ K): 5 well-studied systems (optical range)

Conclusions



Accretion in pre-CVs
Surprise, Surprise?

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(Winter 2009)

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The End