

WILD STARS IN THE OLD WEST II

The case of
EC13471-
1258.

Tiago Ribeiro,
Stella Kafka,
Raymundo
Baptista

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Studying activity in Pre-CVs secondaries: The case of EC13471-1258.

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The hunt for active secondary stars on CVs

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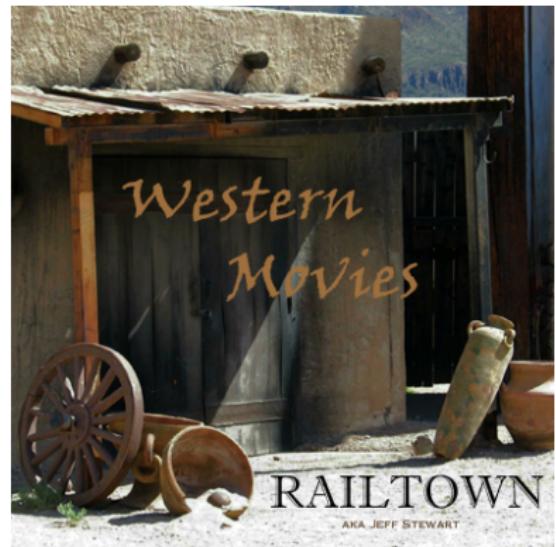
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- Dynamo properties
- Differences above/below the period-gap
- Impact to binary evolution
- Impact on mass transfer history(?)



Part 1: The tale of EC13471-1265 (QS Vir)

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Basic properties (O'Donoghue et al., 2003):

- DA($T_1 = 14000\text{K}$) + M3.5-4V ($T_2 = 3100\text{K}$)
- $P = 3.62\text{h}$ - eclipsing ($i = 75^\circ$)
- Low level accretion?
- Active secondary?
- A hibernating CV?



Shooting the scene: Take 1.

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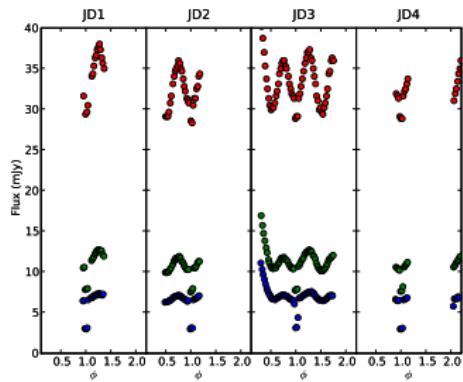
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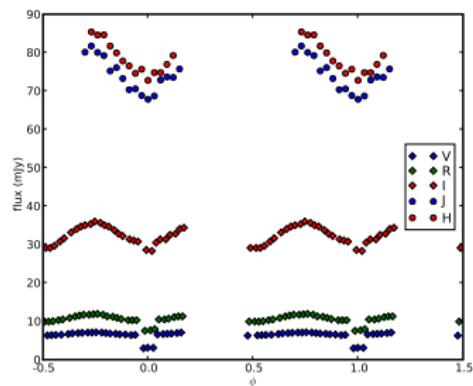
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"... in order to assist modelling of the binary, the VRI photometry are listed in full in table 6." (O'Donoghue et al., 2003)



Flux calibrated using Schaifers and Voigt (1982)



1.6m Perking & Elmer + CAMIV (1024×1024
HAWAII detector) @ OPD, MG - Brasil

Shooting the scene: Take 2.

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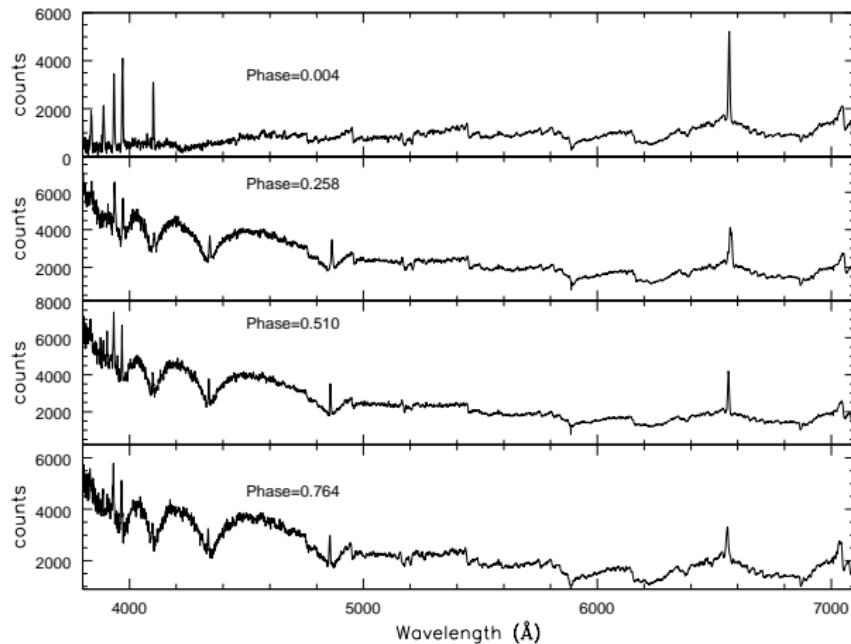
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RC Spectrograph on the CTIO 4-m Blanco



Digging into the gold mine...

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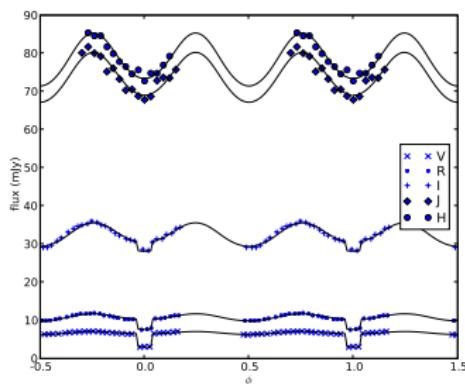
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Par.	V	R	I	J	H
$F_2(mJy)$	3.05 ± 0.02	7.66 ± 0.04	28.2 ± 0.1	68.3 ± 0.4	72.8 ± 0.4
$F_1(mJy)$	3.42 ± 0.02	2.60 ± 0.05	2.2 ± 0.2	0.9 ± 0.1	1.0 ± 0.2
F_2/F_T	47%	74%	93%	99%	99%

Simultaneously fitted parameters:
 $i = (74.9 \pm 0.6)^\circ$ $q = (0.50 \pm 0.05)$
 $i = (75.5 \pm 2.0)^\circ$ and $q = 0.55 \pm 0.1$ (O'Donoghue et al., 2003)



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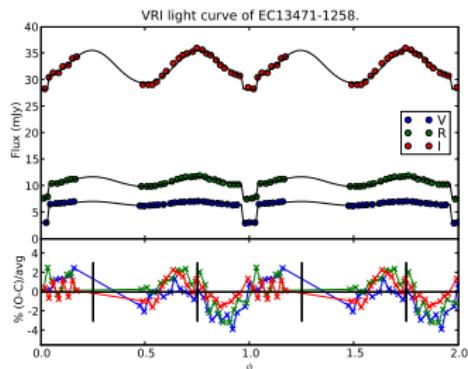
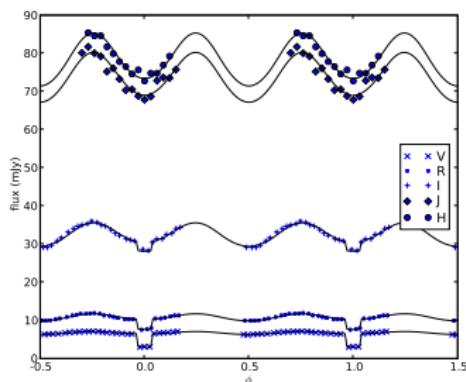
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+ JD3 flaring light curve...

Robbing the bank

Light curve inversion (Lanza et al., 1998)

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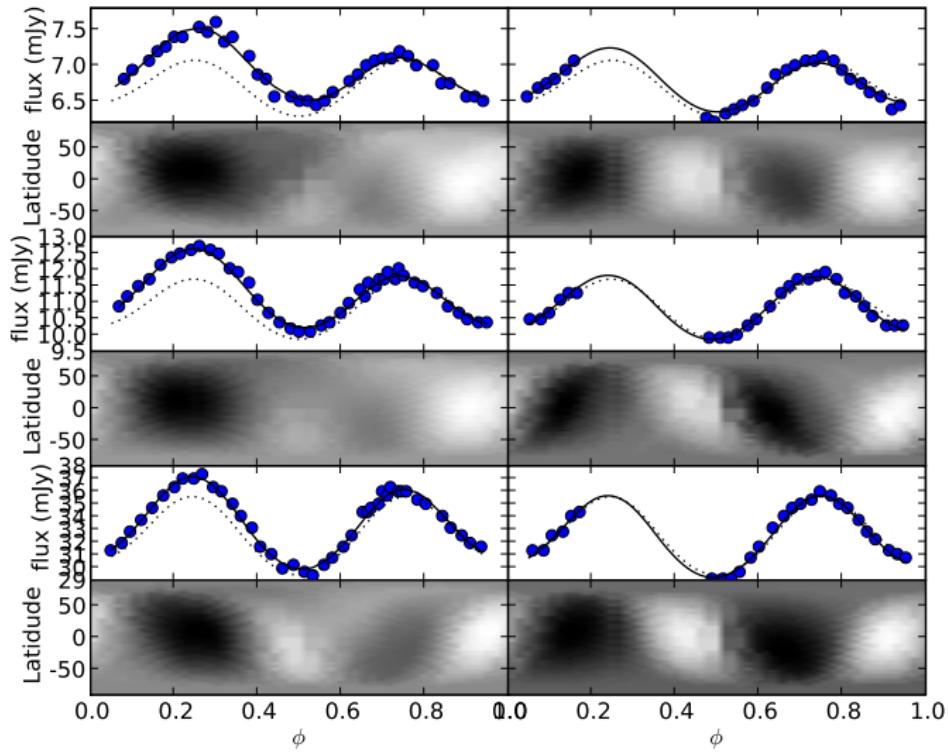
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The hunt RVs and EWs

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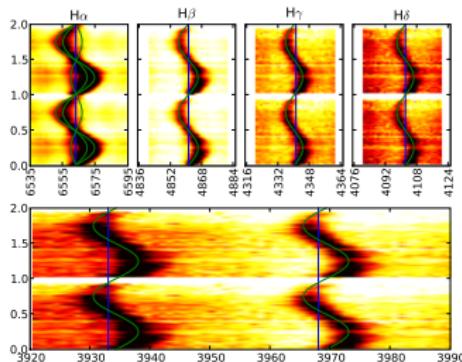
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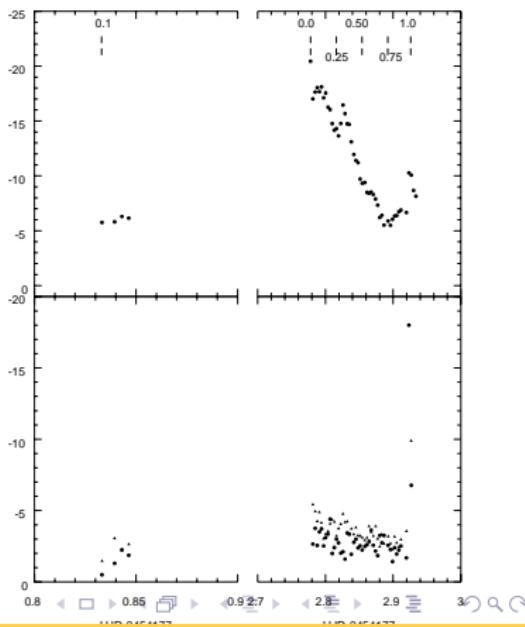
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EW(H α) \sim -17 Å during flaring events and \sim -6 Å normal state (Kawka et al., 2002)



The arrestment

Doppler Tomography: Spruit (1998) MEM code

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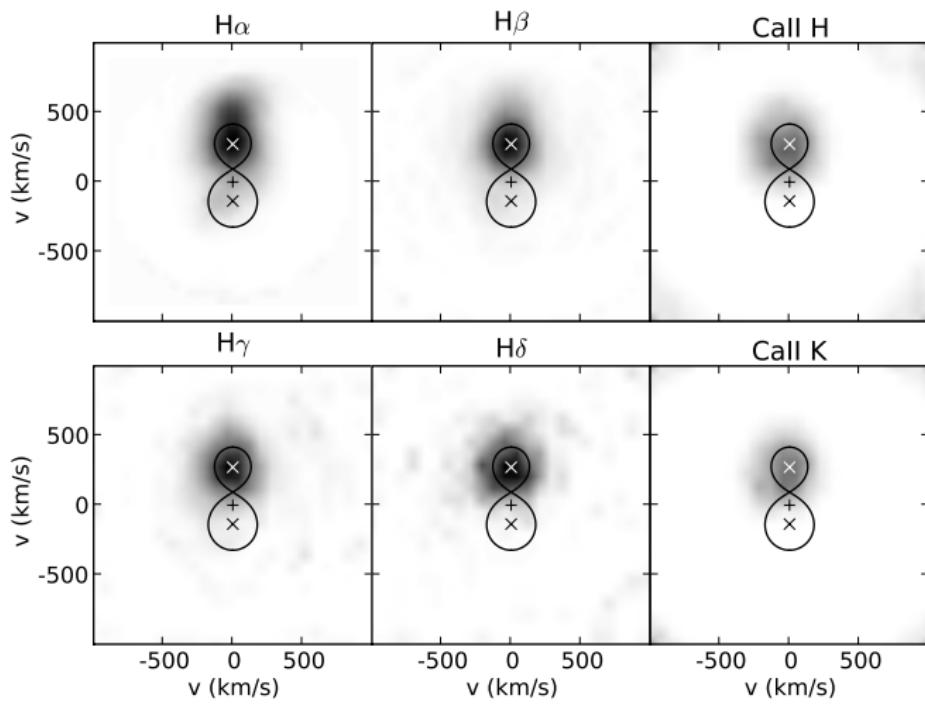
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The judgment

Roche Tomography: Watson and Dhillon (2001)

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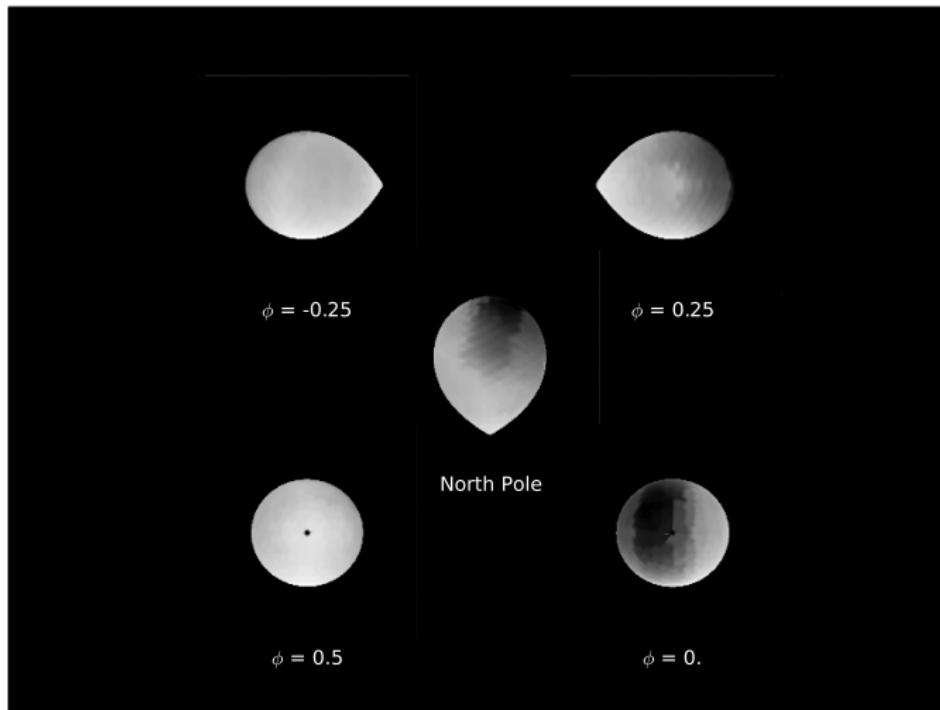
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Hanging × Escaping RT × LC

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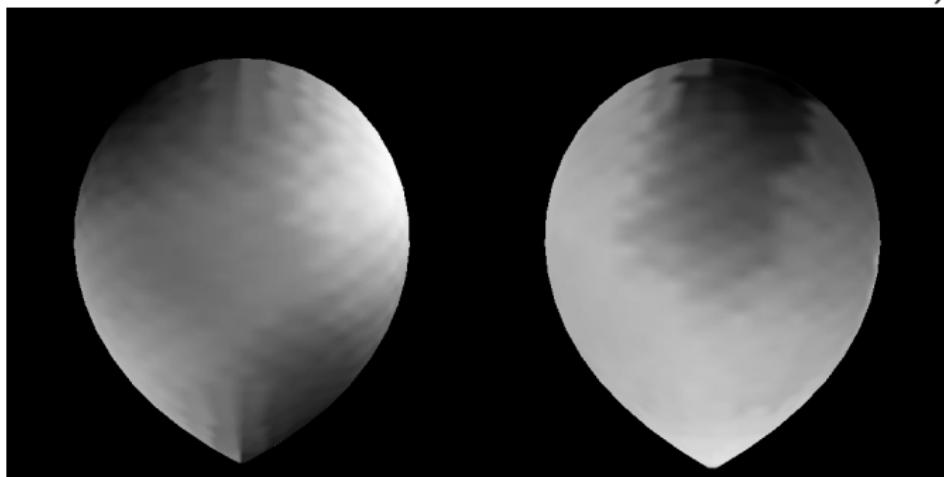
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Correlation between photospheric and chromospheric activity
(Korhonen et al., 2007; Alekseev and Kozlova, 2003, 2002).



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