Hα orbital variations of the symbiotic star EG And from optical spectroscopy

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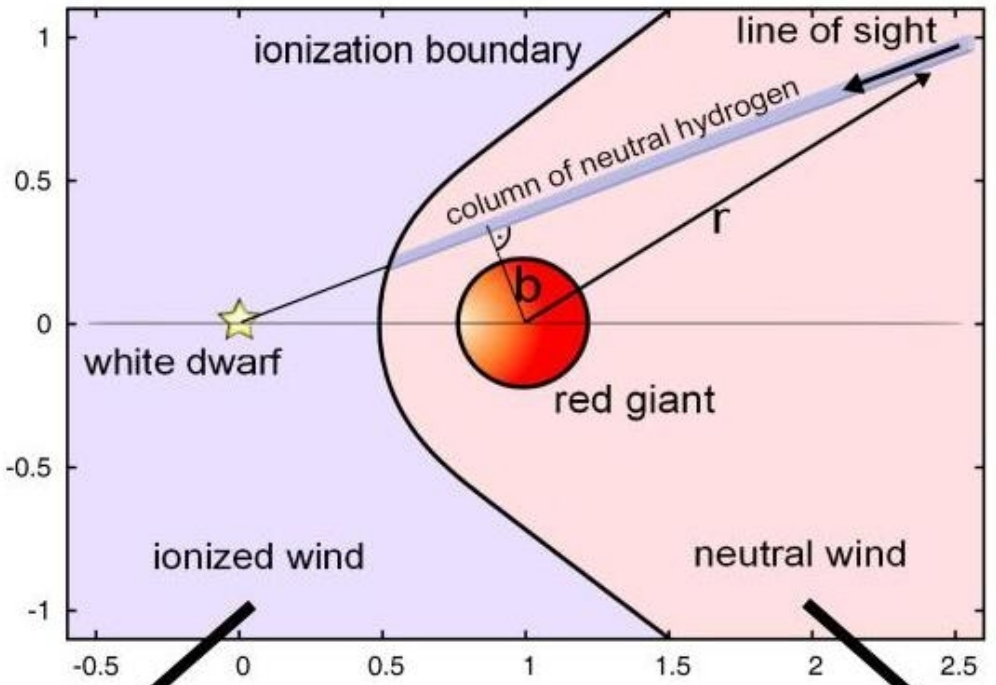
POSTER BP20

Symbiotic stars

Ionization structure in quiescence

Seaquist et al. 1984, *ApJ* 284, 202

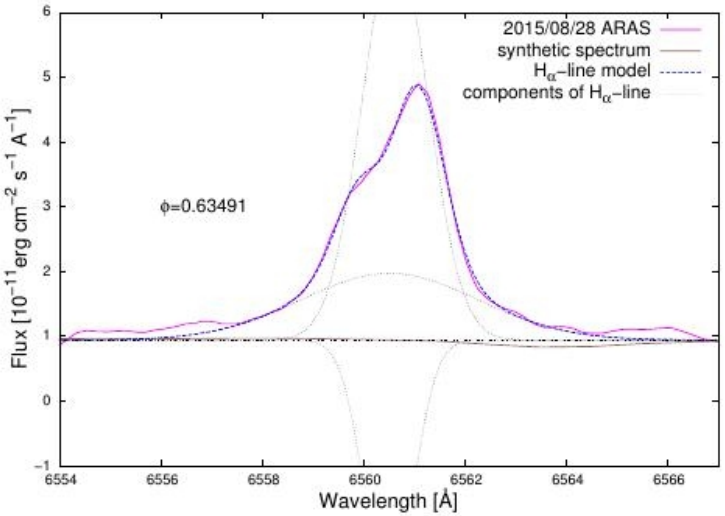


- emission in Hα

- absorption by H^0

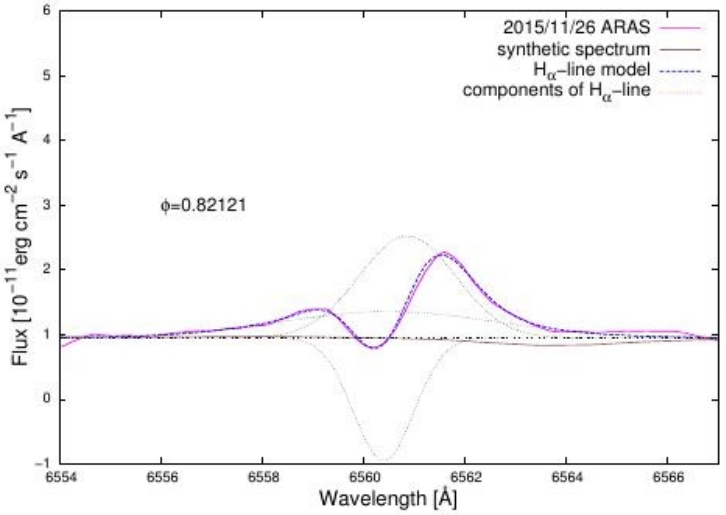
Orbital variations of Hα

- **Hα** line in EG And shows **orbitally-related variability** e.g. Kenyon & Garcia 2016, *AJ* 152, 1
- emission produced in nebula (ionized wind) is strongly affected by **absorption** at most orbital phases



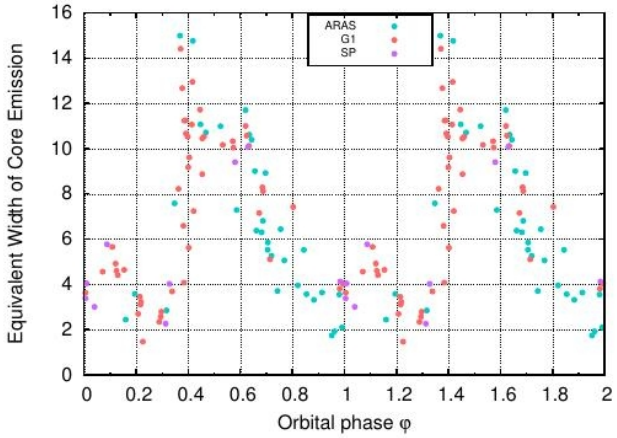
- this effect can be enhanced by the effect of **wind focusing** towards the orbital plane in symbiotic stars

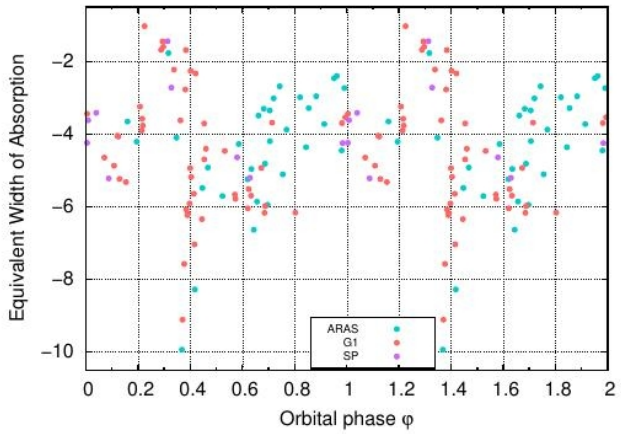
Shagatova & Skopal 2017, A&A 602, A71



- Hα line profile modelled by **three Gaussian components**: narrow core, broad wings and absorption

Results and discussion





- **asymmetric evolution of equivalent widths** with respect to the eclipse time

Evident **asymmetric distribution of the wind matter** with respect to the binary axis, as was also suggested by the light-curve modelling of symbiotic system SY Mus

Shagatova et al. 2016, A&A 588, A83

- both **emission and absorption** are **strongest at φ≈0.4 and weakest at φ≈0.2**

Strong absorption at φ≈0.4 (near the inferior conjuction of the white dwarf) suggests that a **fraction of the ionized wind** region is **optically thick in the Hα-line**

- **core emission** has a **secondary maximum at φ≈0.1**

Possible explanations:

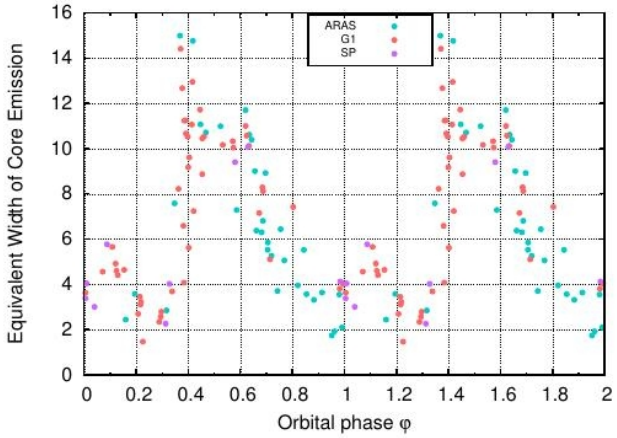
- complex distribution of the wind, as suggested by hydrodynamical simulations of symbiotic stars

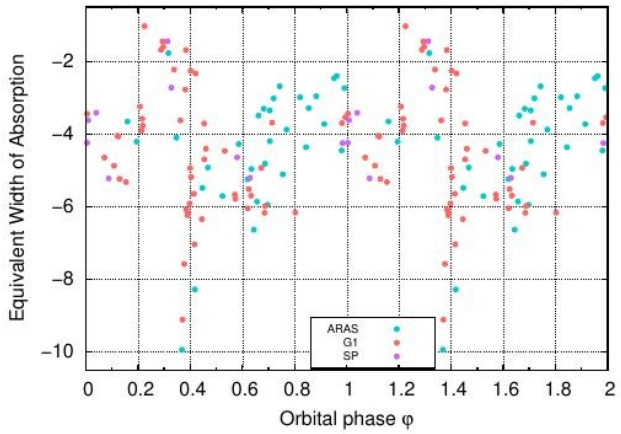
e.g. Walder & Folini 2000, *ASP Conf. Ser.* 204, 331

- the size of the ionized region exceeds that of the giant star

Kondratyeva et al. 2018, *Astrophysics* 61, 3

Results and discussion





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Thank you for attention!

For more details, see poster BP20, e-mail: nshagatova@ta3.sk