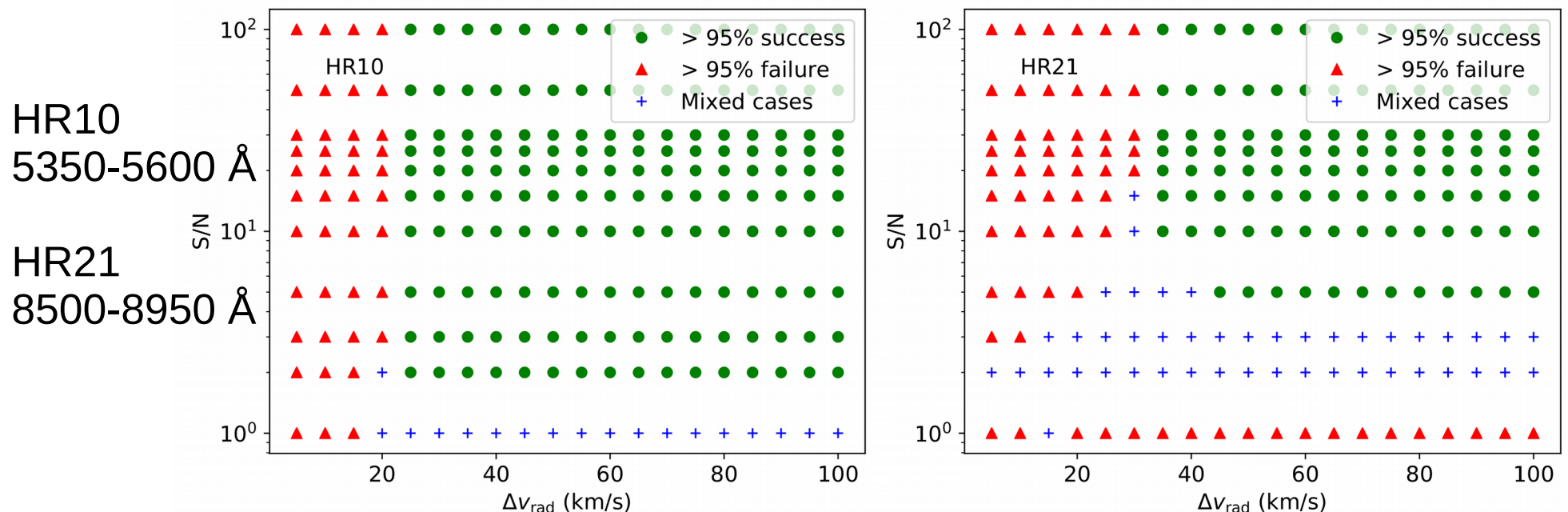


Detection of spectroscopic binaries: lessons from the Gaia-ESO Survey

M. Van der Swaelmen, T. Merle, S. Van Eck, A. Jorissen

Detection efficiency for GIRAFFE HR10 & HR21 setups

- Depends on the setup
- Depends on the S/N of the spectra
- Depends on the difference in radial velocity between the two components



► GIRAFFE HR10 spectra: best detection efficiency

► Observationally, smallest Δv:

25 km/s for HR10

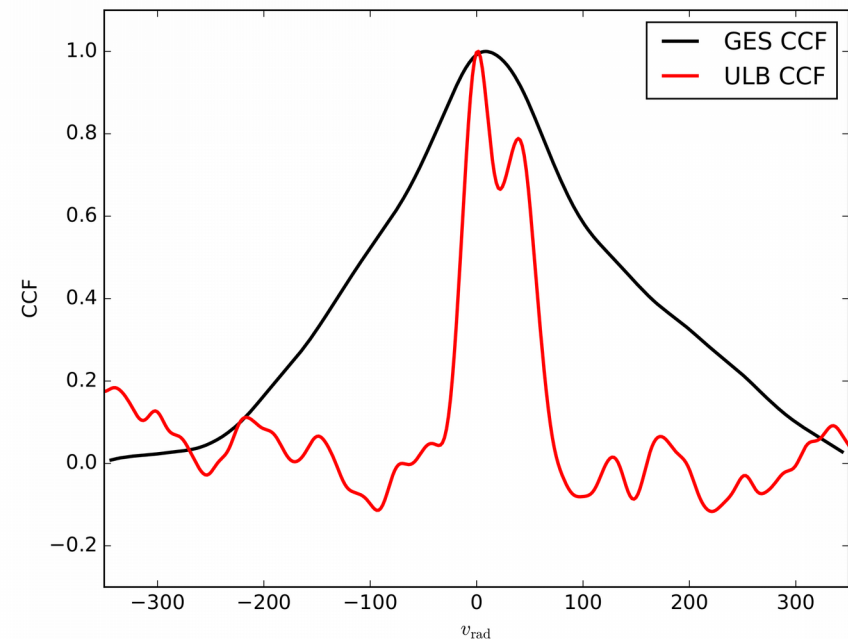
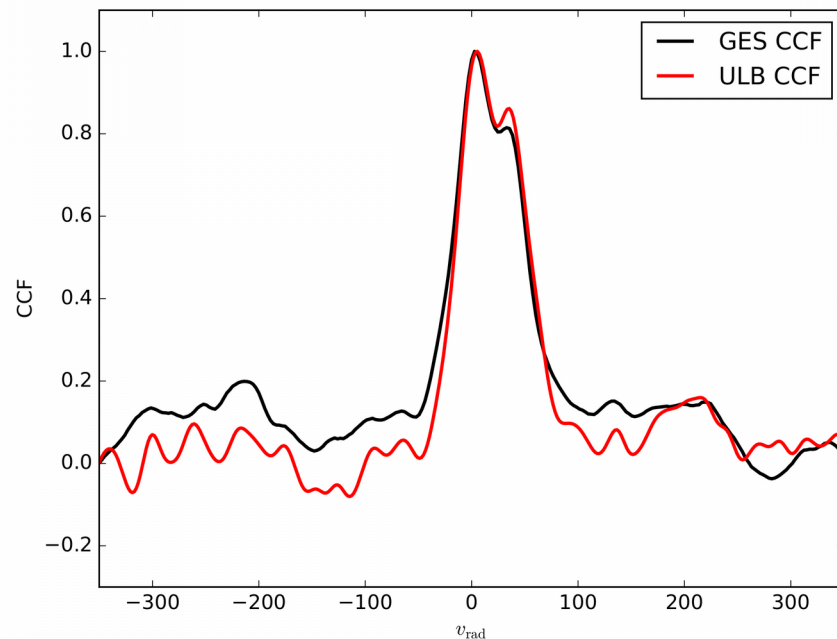
60 km/s for HR21 (Merle et al.)

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Improved computation of cross-correlation functions (CCFs)

- ▶ HR21 spectra host strong lines $\Rightarrow$ tend to broaden the CCFs
- ▶ HR21 masks without those strong lines $\Rightarrow$ narrower CCFs



▶ Example: binary nature of 07272578-0310066

	GES CCF	New CCF
HR10	✓	✓
HR21	✗	✓

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Conclusion

- ▶ Preliminary tests on a subset of SB2s identified by Merle et al. for which the SB2 nature is detected in HR10 GES CCFs but not in HR21 ones:
 - ⇒ $\approx 35\%$ (26 objects out of 72) are now detected as SB2 in both HR10 and HR21
- ▶ Low S/N spectra (>2 for HR10; >5 for HR21) are usable in the context of SB detection
- ▶ HR21 spectral domain resembles that of the Gaia RVS
 - ⇒ RVS CCFs may suffer from similar broadening issues and may benefit from a careful design of correlating masks

Perspectives

We expect to improve our SB GES catalogue:

- ▶ by completing the time series of velocity measures for already known objects (when HR21 did not lead to SB detection)
- ▶ by detecting new SBs among the objects observed only with the HR21 setup
- ▶ by detecting new SBs among the objects for which old HR10/HR21 CCFs did not lead to SB detection