Weakening the Winds with the ULLYSES Data Set: Examining the Presence of a Bi-Stability Jump

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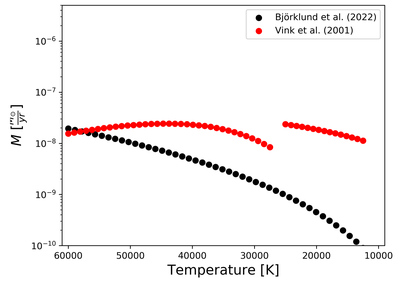
Motivation

- Theoretical mass loss descriptions split
  - Large increase around 25kK
  - Continuous decrease of mass loss rate



- Mass loss rate → major influence on evolution

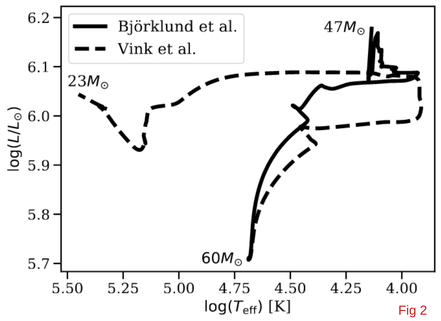


Fig 2

Take-Home Message

The UV ULLYSES data set together with the X-shooter optical data allows us to constrain **mass loss rates** with high precision and **without a degeneracy of the clumping factor**.
The current preliminary results show **high mass loss rates** compared to theory, but there is **no increase for lower temperature** ranges as would be expected for a bi-stability jump.

Methods

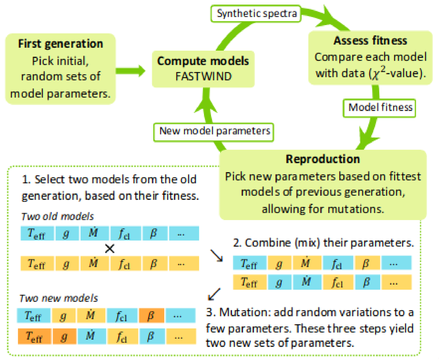
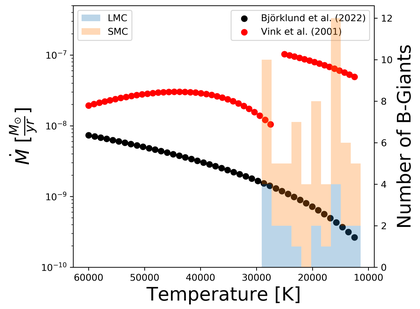


Fig 6

New Data

High resolution UV-spectra have been taken of over 200 O- and B-type stars using the HST in the ULLYSES program. These spectra are supplemented with optical X-shooter data.



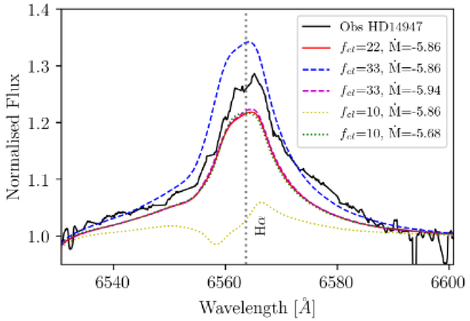


Fig 4

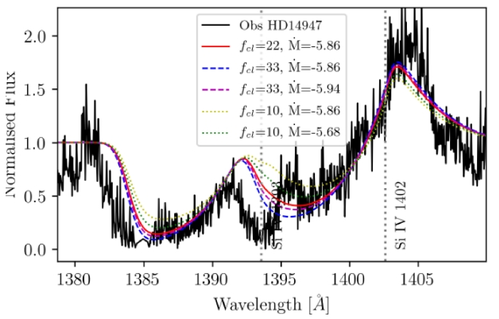
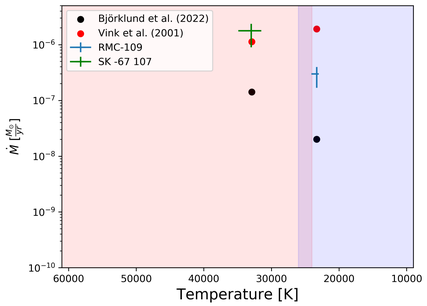


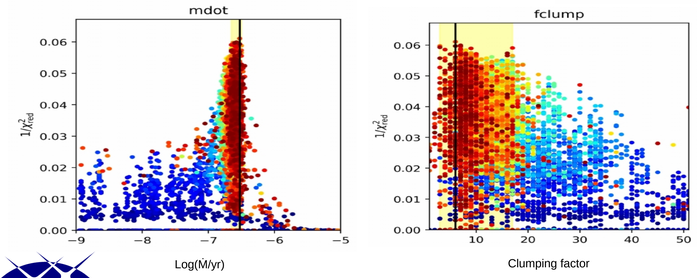
Fig 5

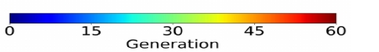
- First results are preformed on the a limited number of UV lines.
- Mass loss rates are high when compared to mass loss prescription.



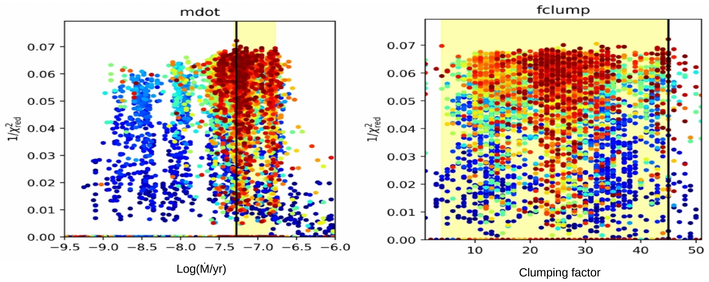
Results

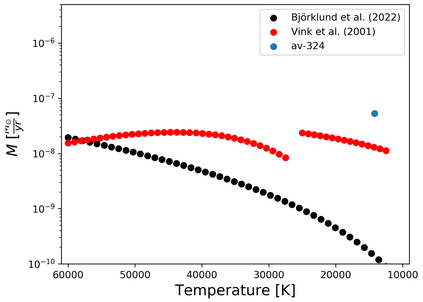
LMC:





SMC:





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[1] [2] Björklund, R., J. O. Sundqvist, et al. ArXiv:2203.08218 [Astro-Ph], 2022.
[4] [5] Hawcroft, C., H. Sana, L. Mahy, J. O. Sundqvist et al. Astronomy & Astrophysics 655 (2021): A67.
[6] Brands, Sarah A., Alex de Koter, Joachim M. Bestenlehner, et al." ArXiv:2202.11080 [Astro-Ph], 2022.