In a cartesian grid, we launch a partially neutral planetary wind using the values from the 1D atmospheric escape model of Allen & Vidotto 2019 and a fully ionised stellar wind using a Parker wind solution. We also launch EUV-photons from the stellar radius.

Our models take into account the gravity of the star and the planet and the stellar radiation pressure.

The rate of change of neutral hydrogen is governed by photoionisation, collisional ionisation and recombination.

**RESULTS**

The planetary wind meets the stellar wind producing a shock and a cometary tail. The amount of neutral material in the tail is governed by the strength of the stellar wind and the stellar LUMO (the contours of dashed lines around the planet). The direction of the tail depends on the strength of stellar wind. A stronger stellar wind pushes the tail in the radial direction.

The shock position depends on the total pressure balance of both winds. For a strong planetary wind and a weaker stellar wind (model H1), the shock can be found closer to the star leading to an eventual falling of planetary material to the star if the balance is never reached.

**SPECTROSCOPIC ANALYSIS**

We calculate the line profile as a function of time from mid-transit for every model. Assuming a Voigt profile, we compute the absorption produced by the planetary neutral material in Lyα and compared them with observations.

To compute the n=2 level population we applied the subroutine $\alpha$ and $H_\alpha$ the planetary neutral material in Lyman and compared them with observations. We calculate the line profile as a function of time from mid-transit for every model. Assuming a Voigt profile, we compute the absorption produced by model H1 when material falls down towards the star, although this model has the smallest absorption depth.

We found no detectable Ho absorption in agreement with observations despite the huge absorption found in Lyα.

**CONCLUSIONS**

- Lyα absorption correlates more strongly with the stellar LUMO in the blue-wing as we found a larger absorption depth for lower LUMO.
- Blue-wing absorption is also dependent on the stellar wind strength, since the absorption depth is larger for a stronger wind (considering the same LUMO).
- Models L1 and M3 can best reproduce the observed blue-wing absorption depth and duration in Lyα, but fail to reproduce the early- ingress or the absorption in the red-wing of the line.
- Early blue-wing absorption in Lyα can be reproduced with model H1 when material falls down towards the star, although this model has the smallest absorption depth.

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