

Supporting stellar clouds within the stellar wind

Cool clouds are supported by closed magnetic loops but these can be embedded within an open field.

Stellar clouds a.k.a. "prominence"

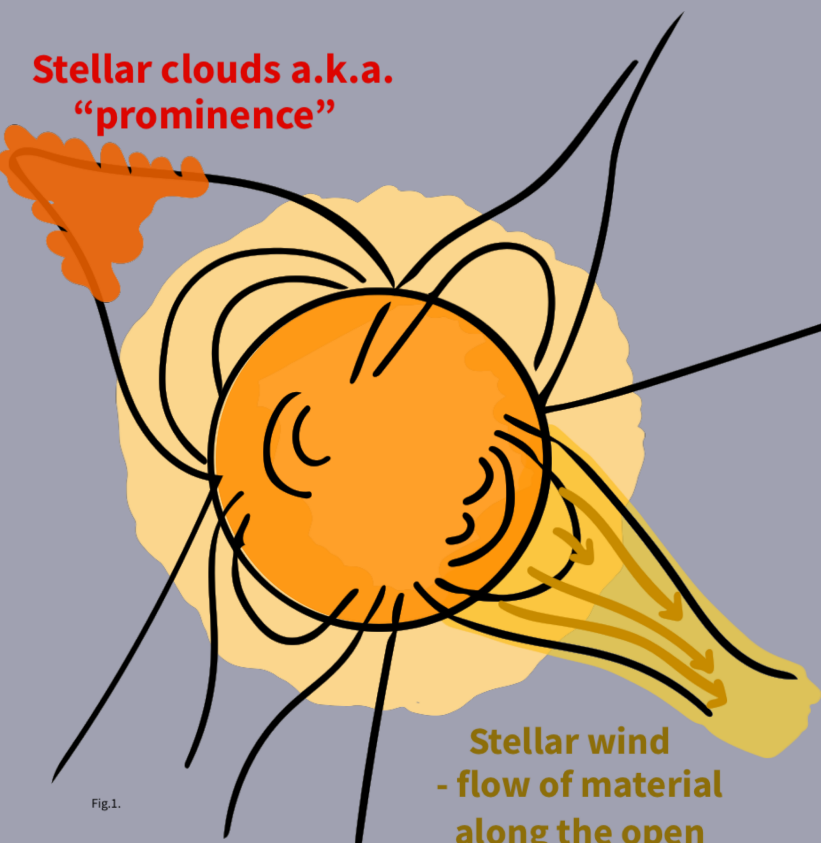


Fig.1.

Stellar wind - flow of material along the open field lines

Motivation:

Cloud presence informs us about the local field structure (B). Understanding B is important for understanding:

- Stellar evolution
- Stellar-planet interaction

Method:

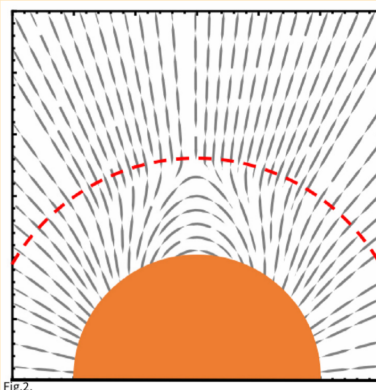


Fig.2.

Use a dipolar field modified to become radial at the **source surface**.

Force balance gives the possible equilibria (or the new shapes) of loops, that cool to form prominences.

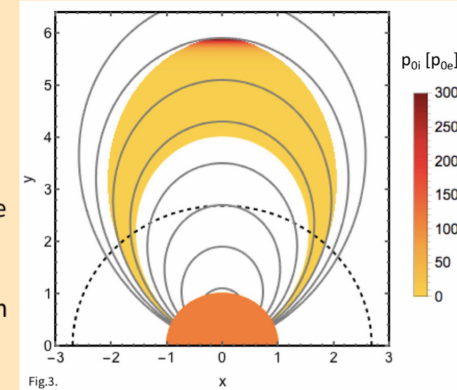


Fig.3.

The very rapid rotation on these stars means that beyond the **co-rotation radius**, the gas pressure increases with height - driving gas into the tops of loops.

co-rotation radius: where an object orbiting the star would stay above the same point on the stellar surface.

Results:

1. These **prominence bearing loops** can be found above the source surface - i.e. within the open field / stellar wind.

2. For the star AB Doradus:

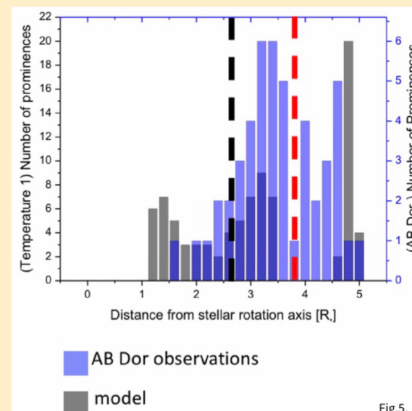


Fig.5.

Use these **loop shapes** as our **model** to make a histogram of the possible distribution of prominences.

Compare to observations.

Modelled distribution shape is reasonable.

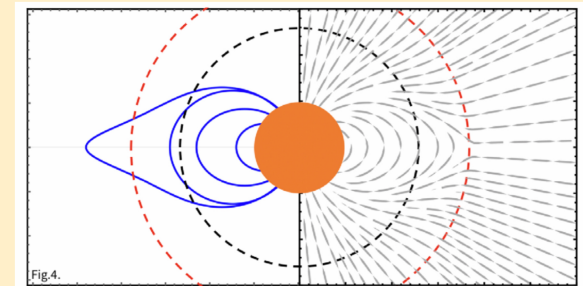


Fig.4.

Prominence loop shapes Stellar magnetic field

Read the paper [here](#):



SCAN ME



Rose Waugh and Prof. Moira Jardine

Email: rw47@st-andrews.ac.uk

Instagram: [@astrophysicist_rose](https://www.instagram.com/astrophysicist_rose)

Twitter: [@astrophys_rose](https://twitter.com/astrophys_rose)