Prominence Effects on Habitability

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Carolyn Brown
University of Southern Queensland
Australia
Outline

• What we know so far
• What about stellar storms?
• Prominence expulsion
• Some examples
• Joining the dots

http://soho.nascom.nasa.gov/spaceweather/lenticular/
Habitability as we know it...

“Habitable Zone”
• Not too hot, not too cold
• Liquid water
• Planetary atmosphere

Planetary magnetosphere and other protective “spheres”

http://blogs.discovermagazine.com/
The Host Star’s impacts on Habitability

- Stellar activity
- Stellar winds
- Magnetosphere impact
- CMEs
- UV radiation
- ...

http://www.virtuosochannel.com/
Solar/Stellar Storms

- Solar storms violently disrupt:
  - Communication
  - Electricity supply
  - Technology in general

- We should be taken into account for intelligent life on other planets?
Prominence Expulsion

• Loop prominences are thought to dictate the extent of the mass hurtled towards the Earth during solar storms
• Prominence expulsion occurs on other stars, and thus the mass of these prominences would dictate the strength of the resulting storms that would effect the surrounding planets.
Prominence Technique

• Tomog - Maps H-alpha variations

![Graph showing H-alpha variations](courtesy of Greg Perugini, Stephen Marsden & Brad Carter)
Examples of Prominence
Active Stars

LQ Lup – full ring prominence system (variable)
Not so Prominence-Active Star

HIP89829 – intermittent prominence system

Courtesy of Greg Perugini, Stephen Marsden & Brad Carter
Somewhere in-between

AP 149 – one sided prominence system

\[ V_X \text{ (km/s)} \quad V_Y \text{ (km/s)} \]
Join the Dots

Nicholson+ submitted
THOUGHTS & QUESTIONS?