



Bennie and the Solar Coronal Jets: The Use of Space-Based and Ground-Based Observations to Analyze Extended Solar

1. University Corporation for Atmospheric Research, Boulder, CO, 2. Washington State University Tri-Cities, Richland, WA, 3. National Center for Atmospheric Research, Boulder, CO

Introduction

- Our Sun is active and complex, as plasma constantly turns and twists.
- The Sun has the equivalent of its own atmosphere called the solar corona, ruled by magnetic forces
- Plasma in the corona can erupt in violent fashion, the largest eruptions threatening modern way of life on Earth.
- Smaller in scale are solar coronal jets, small eruptions thought to be driven by magnetic reconnection (Pariat et al. 2015).
- There remain many questions about the precise mechanisms behind all solar eruptions.



Coronal Jets

Chandler Jenkins^{1, 2}, Samaiyah Farid³



Cor data





Atmospheric Imaging Assembly <u>(AIA)</u>

- observations
- Calculated Extreme Ultraviolet (EUV) velocity using time distance plots
- Calculated white-light jet velocities using difference in time and distance between two jet images
- Velocity of plasma can vary drastically between different wavelengths in extended solar corona jets.
- Velocity of the extended jets still within expected ranges of other studies on these jets (Nisticò et al. 2009).
- Twisted structure and high energy of the 09/03/2022 jet is of particular note; other forces could be accelerating it.
- Extended white-light jets seem to move at much faster rates than normal white-light jets but expected velocities for extended jets (Paraschiv et al. 2010).
- Larger sample size as well as detailed magnetic field modeling needed to assess the formation of these extended jets.

References and Acknowledgements

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Paraschiv, A. R., D. A. Lacatus, T. Badescu, M. G. Lupu, S. Simon, S. G. Sandu, M. Mierla, and M. V. Rusu, 2010: Study of Coronal Jets During Solar Minimum Based on STEREO/SECCHI Observations. Sol Phys, 264, 365–375, https://doi.org/10.1007/s11207-010-9584-6.

Nisticò, G., V. Bothmer, S. Patsourakos, and G. Zimbardo, 2009: Characteristics of EUV Coronal Jets Observed with STEREO/SECCHI. Sol Phys, 259, 87–108, <u>https://doi.org/10.1007/</u>. <u>s11207-009-9424-8</u>

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17:30 17:40 Start Time (21-Jul-20 17:15:05) Figure 2 Time-Distance plot of 07/21/2020 jet



K-Coronagraph (K-Cor)

We used data from our "space-based" instrument AIA and "ground-based" instrument K-Cor to make jet

Summarv