

## Relationships between solar wind parameters

**Heather Elliott**<sup>1</sup>

<sup>1</sup>*Southwest Research Institute, San Antonio, United States*

In the inner heliosphere, both source properties at the Sun and in the corona combined with dynamic interactions that occur as the solar wind propagates away from the Sun produce relationships amongst pairs of the solar wind and IMF parameters. The solar wind speed can correlate with the density and temperature because fast wind from coronal holes tends to have lower density and higher temperatures than slow wind associated coronal streamers or the edges of coronal holes. As the Sun rotates, different regions on the surface of the Sun emit wind of different speeds along the same radial line. This results in dynamic interactions developing en route as the wind propagates away from the Sun. For example, a fast wind parcel emitted after a slow wind region along the same radial will eventually run into the slower parcel ahead of it. Where the fast wind runs into the slow wind, a compression region forms that has elevated density, temperature, and field strength. As the solar wind continues to move away from the Sun, the interaction between the fast and slow wind structures causes these structures to merge and be worn down significantly reducing the variability of the wind in the outer heliosphere. In the outer heliosphere as the solar wind encounters an increasing amount of interstellar material the solar wind picks up interstellar material which slows and heats the solar wind. In this study we examine, the relationships between solar wind parameters and how these evolve with distance.