Large-Scale Alfvenic Impulses on the Sun: How They Are Generated and What We Learn From Them

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The Sun's atmosphere hosts a wide variety of magnetosonic disturbances. These wave modes are detected, almost exclusively, by examining images of the Sun's magnetic atmosphere and looking for propagating distortions. Although none of the Sun's plasma parameters are measured directly, we derive a great deal of information from these observations. In fact, by modeling these propagating disturbances, we may be able to derive the most accurate estimates plasma parameters. From observations absorption, refraction, reflection, and coupling of numerous wave modes, we advance our knowledge of the Sun's magnetic field, temperature, density, and current.

The Sun's continuous oscillation, coronal mass ejections, flares, and other dynamic phenomena can produce wave disturbances which are observable from near-Earth space. Several of these disturbances have been traced from the inner corona out into the heliosphere. From the generation of these disturbances, we are able to learn about the phenomena which create them as well as the media through which they're propagating.

The presentation will include a discussion of the generation of Alfvenic disturbances on the Sun, ways we observe these disturbances, and how recent advances in modeling and analysis have brought us closer to determining solar in situ parameters.