

Photospheric Flows: A Key Link Between the Solar Interior & Atmosphere

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Abstract: Magnetic coupling between the solar interior and atmosphere is responsible for essentially all variability in the Sun's output: coronal heating, solar flares, coronal mass ejections (CMEs), and heating and acceleration of the solar wind. All of these processes are magnetically driven; that is, they release magnetic energy stored in the atmosphere, whether in currents or waves. And the energy that is released, ultimately, originates within the solar interior, to which the magnetic fields involved are tethered. Accordingly, key open questions in solar physics involve understanding how energy passes from the interior into the atmosphere, and how this energy is subsequently released. This understanding is not easily achieved, however, because the solar corona, a highly non-linear system, is driven by the convecting solar interior, which is another highly non-linear system! After briefly reviewing aspects of coupling between the solar interior and its outer atmosphere (including the outward transport of magnetic energy), I will discuss what we **have** learned (from Hinode and SDO) and what we **can** learn (from DKIST) by studying flows in the solar photosphere --- at the interface between the interior and the atmosphere.

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References:

Session 5: Space plasma physics and nonlinear processes in space geophysics

Plenary talk

