



Contribution ID: 311

Type: Talk

## Helioseismic evidence for large-scale flow cells in the solar convection zone

*Monday, 6 September 2021 10:00 (15 minutes)*

The results of helioseismological inferences of subsurface flow velocities by time–distance techniques are used to analyse the spatial structure of subphotospheric convection. The source data are obtained from the Helioseismic and Magnetic Imager onboard the Solar Dynamics Observatory from May 2010 to September 2020. The helioseismic-inversion results produce the three-dimensional flow fields in a 19-Mm deep layer below the photosphere in a range of latitudes and Stonyhurst longitudes from  $-60^\circ$  to  $+60^\circ$  with an 8-hour cadence. We study the convective flow structures of various scales and shapes by applying a spherical harmonic transform to the horizontal-velocity-divergence field. The results reveal a signature of large-scale flow cells in the spatial power spectrum, which may represent the “giant cells” of solar convection. In particular, indications are found for meridionally elongated flow cells, which are considerably smaller in the longitudinal direction than in latitude. The physical properties of the multi-scale convection cells and their evolution in the course of the solar activity cycle are discussed.

### Student poster?

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**Session Classification:** Plenary 1

**Track Classification:** Session 1 - Solar Interior, Dynamo, Large-Scale Flows and the Solar Cycle