Contribution ID: **340** Type: **Poster**

Using Bright-Point Shapes to Constrain Wave-Heating of the Solar Corona: Opportunities for DKIST

Magnetic bright points on the solar photosphere mark the footpoints of kilogauss magnetic flux tubes extending toward the corona. Convective buffeting of these tubes is believed to excite magnetohydrodynamic waves, which can propagate to the corona and there deposit heat. Measuring wave excitation via bright-point motion can thus constrain coronal and heliospheric models, and this has been done extensively with centroid tracking, which can estimate kink-mode wave excitation. DKIST is the first telescope to provide well-resolved observations of bright points, allowing shape and size measurements to probe the excitation of other wave modes that have been difficult, if not impossible, to study to date. In this work, we demonstrate a method of automatic bright-point tracking that robustly identifies the shapes of bright points, and we develop a technique for interpreting measured bright-point shape changes as the driving of a range of thin-tube wave modes. We demonstrate these techniques on a MURaM simulation of DKIST-like resolution. These initial results suggest that modes other than the long-studied kink mode could increase the total available energy budget for wave-heating by 50%. Pending observational verification as well as modeling of the propagation and dissipation of these additional wave modes, this could represent a significant increase in the potency of wave–turbulence heating models. We also present early efforts to apply this tracking and method to DKIST observations.

Primary authors: VAN KOOTEN, Samuel (Southwest Research Institute); Dr CRANMER, Steven (University of Colorado, Boulder)

Session Classification: Coffee break and poster session 1

Track Classification: Energy and mass transfer throughout the solar atmosphere and structures within