

## **Radial Extent of Preferential Ion Heating in the Corona and Solar Wind**

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The physical mechanism responsible for the high temperatures of the solar corona and the solar wind is capable of heating different ion species unequally, resulting in temperatures that are proportional to mass, or even supra-mass proportional. Spectroscopic measurements of coronal ions indicate that these uneven temperatures emerge within tenths of solar radii from the surface of the Sun. It is possible that preferential heating occurs closer to the surface of the Sun, but only at these heights are Coulomb collision rates sufficiently low that different temperatures can persist long enough to be observed. Solar wind ions in interplanetary space are also often seen to have unequal temperatures, but are these differences due to ongoing preferential heating or a signature of a process that occurred much closer to the Sun? This presentation will demonstrate a new technique that uses interplanetary solar wind observations from the Wind spacecraft and a model for the effects of Coulomb collisions to solve for the typical outer boundary of preferential ion heating. We will compare our results with theoretical models of solar wind heating, and make predictions for the upcoming Solar Probe Plus and Solar Orbiter missions to the inner heliosphere.