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Oral

We at the University of California, San Diego (UCSD) have developed a time-dependent three-dimensional (3-D) reconstruction technique that provides volumetric maps of density and velocity by iteratively fitting a kinematic model to interplanetary scintillation (IPS) observations. This system is compared with NOAA- and NASA-provided in-situ spacecraft measurements, and is used for real time predictions of solar wind parameters at Earth and globally throughout the heliosphere. In addition, magnetic fields are extrapolated outward from the solar surface using the velocity data from the iterative procedure (see the UCSD website https://ips.ucsd.edu/high-resolution_predictions). With data from ISEE, Japan, we have used this system to provide low resolution measurements at Venus, and at the spacecraft BepiColombo and Solar Orbiter throughout the period around 10 August 2021. These analyses forecast conditions several days in advance these spacecraft would encounter as they passed the planet. This provided the solar wind context information for the conditions each spacecraft faced as they entered the shocked plasma surrounding the planet and traversed through the Venus magnetosphere. Some of these same analyses can be certified by the Akatsuka spacecraft, also now orbiting Venus. A detailed study of the Venus magnetospheric encounter is ongoing from the various in-situ monitors on each spacecraft.

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