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The Parker Solar Probe WISPR Instrument: Status and Observations

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The PSP mission was launched Aug 12, 2018 into orbit about the Sun. In Oct/Nov it performed its first perihelion pass at 0.16 AU (36 solar radii). We present the plans and first observations of the corona for the WISPR instrument on the PSP mission. Observing the corona/solar wind from 0.25 AU to the ultimate perihelion distance of 0.04 AU is absolutely unique, but presents new challenges due to the rapidly changing heliocentric distance. WISPR, a heliospheric imager type of instrument, consists of two telescopes, which together observe in the spacecraft ram direction along the ecliptic plane from 13.5 - 108 deg from the Sun. This range of elongations encompasses the Thomson circle (the locus of points of maximum Thomson scattering efficiency) thereby transitioning from remote observations of structures close to the Sun to local observations of structures close to the spacecraft. Three different types of observations are envisioned: synoptic full field, partial field high cadence shock studies and partial field turbulence studies. The last one is a sequence of images at a 10-second cadence for which a power spectrum of intensity or electron density will be generated at selected heights in the corona, to see where wave energy is being deposited. In these preliminary images we anticipate that the view will be quite different as PSP plunges into the corona than the view from 1 AU. The spatial resolution will be greatly increased as we fly through the coronal structures and will reveal fine-scale details such as fluctuations in the plasma sheet, perhaps indicating individual flux tubes or magnetic islands or maybe something totally unexpected. The vantage points will remove a large fraction of the circumsolar dust contributing to the F-corona, perhaps also revealing the first dust to sublimate. To prepare for the mission, techniques have been developed to determine the background, track features that are moving through the field of view, among others. Due to the relative positions of PSP, Earth and the Sun, only a small fraction of the data has been received on ground, but WISPR has worked well through the first perihelion. We gratefully acknowledge support from the NASA Parker Solar Probe Project.