Depletion of the Interplanetary Dust Close to the Sun

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Images from the STEREO/SECCHI/HI-1 heliospheric imager (launched in 2006) and the PSP/WISPR (launched in 2018) have been used to update and extend the historical observations of the zodiacal light (ZL), (e.g., Leinert et al 1981). The recent observations from WISPR have shown a steady decrease in the brightness beginning at 19 Rsun (0.1 AU) down to about 5 Rsun where a long-postulated dust free zone begins. This result is the latest in a series of papers analyzing the SECCHI observations to prepare for the similar observations to be obtained from the Parker mission. We will also discuss the following updates to the Helios observations by Leinert:

(1) Constancy of the intensity of the symmetry axis of the ZL; (2) Extension of the exponent of the radial profile from -2.3 to -2.31 down to 0.1 AU; (3) Confirmation of a slight increase in the slope approaching the Sun; (4) Observation of the dependence of the inclination and ascending node on heliocentric distance; (5) Center of the Zodiacal Cloud offset toward the barycenter; (6) Determination of the shape of the ZL as a function of heliocentric distance; (7) Discovery of dust in or near the orbit of Mercury; (8) Discovery of dust in or near the entire orbit of Venus.