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He+ Suprathermal Tails as Observed by STEREO/PLASTIC

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Suprathermal tails in He+ have been investigated using the STEREO/PLASTIC instrument, in the energy range ∼1-20 keV/nuc. In this energy range, a persistent spectrum of the form (V/Vsw)-5 has been reported by Gloeckler et al (e.g. 2007) for He+ in the solar wind frame. V/Vsw is the ratio of the particle speed to the solar wind speed. In this initial investigation, He+ tails were characterized for the first 10 months of 2008, using the STEREO A spacecraft. This period featured many corotating interaction regions. Incorporating a preliminary transformation from the spacecraft frame to the solar wind frame, the PLASTIC A observations for the He+ tail have a spectral index of -5.2 +-0.1, for 2 <= V/Vsw <= 5. Interestingly, if only slow solar wind speed periods are included, the spectrum steepens. The suprathermal tail spectral index for solar wind speeds of 327 km/s or less is is -9.0 +-0.4. The extent to which this result may be influenced by the simple transformation in use so far between solar wind and spacecraft frames will be considered by introducing an improved frame transformation, using directional information from PLASTIC.