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## Ripples in the Heliospheric Current Sheet: Dependence on Latitude and Transient Outflows

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The recent launches of Parker Solar Probe (PSP), Solar Orbiter (SO) and BepiColombo, along with several legacy spacecraft, have provided the opportunity to study the solar wind at multiple latitudes and distances from the Sun simultaneously. We take advantage of this unique spacecraft constellation, along with low solar activity between May and July 2020, to investigate how latitude affects the solar wind and Heliospheric Current Sheet (HCS) structure. We use ballistic mapping to compare polarity and solar wind velocity between several spacecraft, showing that fine scale ripples in the HCS can be resolved down to several degrees in longitude. We show that considering solar wind velocity is also useful when investigating the HCS structure, as it can reveal times when the spacecraft is within slow, dense streamer belt wind without changing magnetic polarity. We measured the local orientation of planar magnetic structures associated with HCS crossings, finding that these were broadly consistent with the shape of the HCS but at much steeper angles due to compression from stream interaction regions. We identified several transient magnetic clouds associated with HCS crossings, and have shown that these can disrupt the local HCS orientation up to four days after their passage, but did not significantly affect the position of the HCS. This work highlights that the heliosphere should always be treated as three-dimensional, especially at solar minimum, where a few degrees in latitude can create a considerable difference in solar wind conditions.