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STEREO Observations of Solar Wind in 2007-2014

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Since the launch of twin STEREO spacecraft, we have been monitoring the solar wind and providing the Level 3 event lists of large-scale solar wind and particle events to public (http://www-ssc.igpp.ucla.edu/forms/stereo/stereo_level_3.html). The interplanetary coronal mass ejections (ICMEs), stream interaction regions (SIRs), interplanetary shocks, and solar energetic particles (based on high energy telescope data) have been surveyed for 2007-2014 before STEREO A went to the superior solar conjunction and STEREO B was lost in contact. In conjunction with our previous observations of same solar wind structures in 1995-2009 using Wind/ACE data and the same identification criteria, we study the solar cycle variations of these structures, especially compare the same phase of solar cycles 23 and 24. Although the sunspot number at solar maximum 24 is only 60% of the level at last solar maximum, Gopalswamy et al. (2015a, b) found there were more halo CMEs in cycle 24 and the number of magnetic clouds did not decline either. We examine if the two vantage points of STEREO provide a consistent view with the above finding. In addition, because the twin STEREO spacecraft have experienced the full-range longitudinal separation of 0-360 degree, they have provided us numerous opportunities for multipoint observations. We will report the findings on the spatial scope of ICMEs including their driven shocks, and the stability of SIRs from the large event base.