

README FOR STEREO PLASTIC SMALL TRANSIENTS LIST

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Data Usage:

Data provided by the PLASTIC team at the University of New Hampshire is under NASA grant NNX15AU01G.

Small Transient (ST) data provided here is courtesy of W. Yu and C. Farrugia.

The table lists some STs observed by the STEREO spacecraft from year 2007 to year 2014 (Yu et al., [2014], [2016]). They are identified by the following criteria.

1. The STs have durations between 0.5 and 12 hours.
2. Magnetic field strength is higher than the yearly average (> 1.3 times yearly average).
3. Low proton beta (less than 0.7 times yearly average) or low proton temperature ($T_p/T_{\text{exp}} < 0.7$).
4. Low Alfvén Mach Number (less than 0.7 yearly average), or large rotations of magnetic field components (we used the minimum variance analysis on the magnetic field, Sonnerup and Cahill Jr. [1967], Sonnerup and Scheible [1998]; and we require that the intermediate-to-minimum eigenvalue ratio be > 5).
5. Checking the Alfvénic fluctuations.

We remove the events which satisfy the relation $\Delta V_{\perp} = \frac{\Delta B_{\perp}}{\sqrt{\mu_0 \rho}}$. We remove all three correlations (R_x, R_y, R_z) greater than 0.5, or two greater than 0.6 and the other greater than 0.3 from our list, which is similar to the criterion in Cartwright and Moldwin [2008].

Note: The asterisk (*) in the ST lists mean this ST was in the time ranges which ICMEs have been observed. We call them “ICME-like STs”. (The lists of the ICMEs observed by STEREO which have been used are got from: Jian et al., 2006, www-ssc.igpp.ucla.edu/~jlan/STEREO/Level3/STEREO_Level3_ICME.pdf.)

If used in presentations or publications:

We strongly suggest that Dr. C.J. Farrugia (charlie.farrugia@unh.edu) and Dr. Wenyuan Yu (unhyuan@gmail.com) be contacted to ensure that you are working with the latest release.

Please acknowledge STEREO PLASTIC Investigation (A.B. Galvin, PI) and NASA Grant NNX15AU01G.

For reporting purposes, we request bibliography information for any publication, etc., using these data. Please send information on the use of this data to the PLASTIC PI:

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If you have questions regarding the data formats, please contact the PLASTIC Data System Manager:

Dr. Lorna Ellis
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File Naming convention:

STx_L3_PLA_SmallTrans_Vyy.txt

Where:

"STx" is given as "STA" or "STB" for STEREO A and STEREO B, respectively.

"L3" indicates Level 3 data in the STEREO PLASTIC convention.

"PLA" indicates Plasma and Suprathermal Ion Composition (PLASTIC) Investigation.

"SmallTrans" indicates the Small Transient data product.

"Vyy", indicates Version number, with the processing version given by the "yy."

"pdf" indicates a portable document file.

Explanation of Columns in STs list:

Column 1 – Event number

Column 2 – Start time

Column 3 – End time

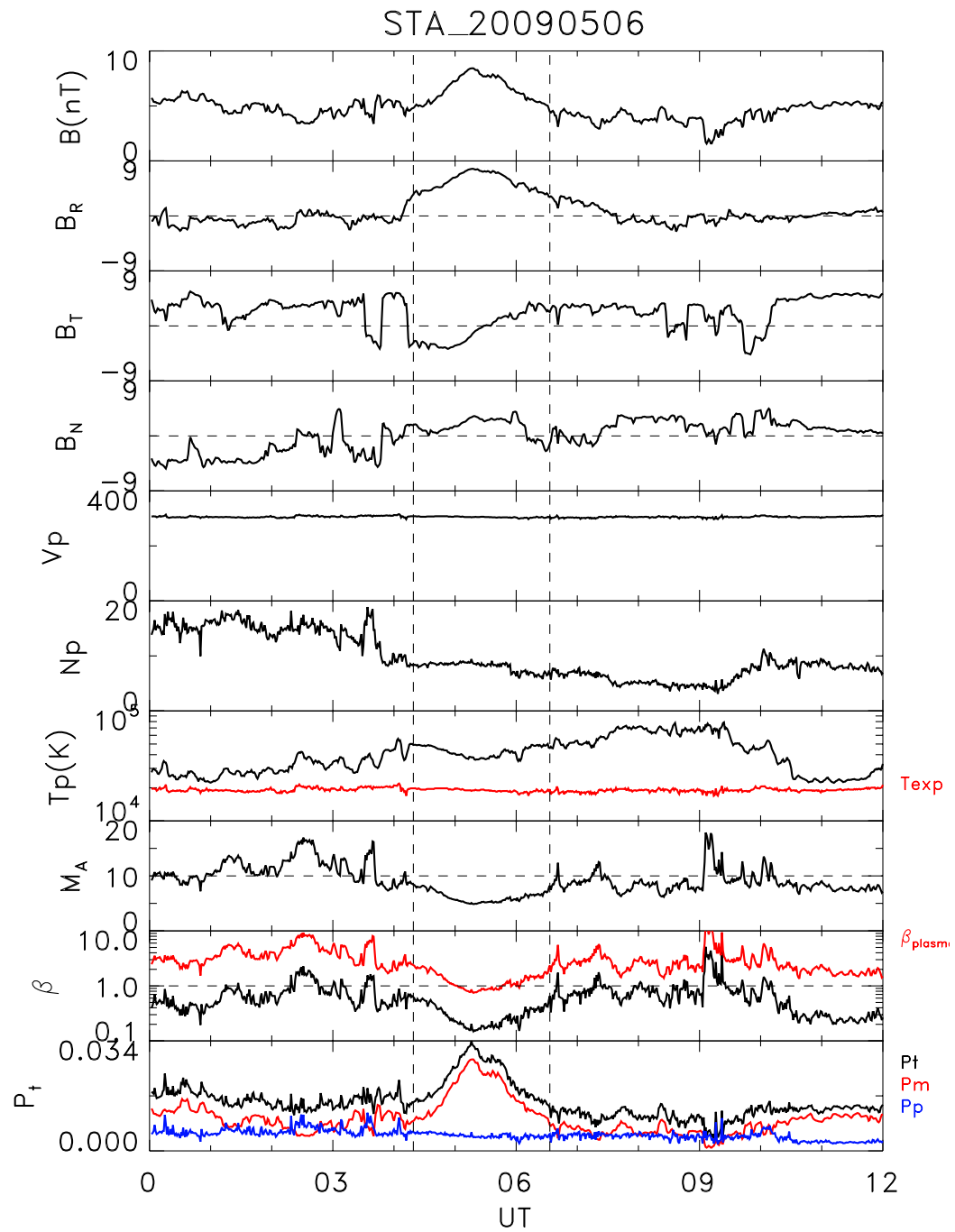


Figure 1. An example of a ST observed on May 6, 2009 from STA.

References:

M.L. Cartwright and M.B. Moldwin, Comparison of small-scale flux rope magnetic properties to large-scale magnetic clouds: Evidence for reconnection across the hcs? *Journal of Geophysical Research: Space Physics*, 113 (A9), 2008.

B.U.Ö. Sonnerup and L.J. Cahill Jr., Magnetopause structure and attitude from explorer 12 observations. *Journal of Geophysical Research*, 72(1): 171-183, 1967.

B. U. Ö Sonnerup and M. Scheible, Minimum and maximum variance analysis. *Analysis methods for multi-spacecraft data*, pages 185 – 220, 1998.

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