GEOTAIL Magnetospheric Regime Identification Data Product

A detailed study of Geotail data resulted in a characterization of the Earth's magnetosphere for the period of 1 Oct 1992 through 31 Oct 1994. This characterization was recorded in a regime identification data product consisting of a series of sequential time intervals and associated values of Kp, position and regime ID. The RID data product is an ASCII, space-delimited, fixed-column formatted file. Table 1 illustrates the contents of this RID file.

Table 1 – Sample Regime Identification contents

Start Date/Time	End Date/Time	Interval minute	Kp min	Kp avg	Kp max	Start_Pos_(GSE Re) X	Start_Pos_(GSE Re) Y	Start_Pos_(GSE Re) Z	Stop_Pos_(GSE Re) X	Stop_Pos_(GSE Re) Y	Stop_Pos_(GSE Re) Z	Region	= ##
92-275 0000 -	92-275 0118	78	4.0	4.0	4.0	-131.8	-9.7	15.7	-131.7	-9.9	15.6	BL	= 33
92-275 0118 -	92-275 0124	6	4.0	4.0	4.0	-131.7	-9.9	15.6	-131.7	-9.9	15.6	MS/BL	= 43
92-275 0124 -	92-275 0250	86	4.0	4.0	4.0	-131.7	-9.9	15.6	-131.6	-10.0	15.6	MS	= 44
92-275 0250 -	92-275 0256	6	4.0	4.0	4.0	-131.6	-10.0	15.6	-131.6	-10.0	15.6	MS/BL	= 43
92-275 0256 -	92-275 0345	49	4.0	4.7	5.3	-131.6	-10.0	15.6	-131.5	-10.1	15.6	BL	= 33
92-275 0345 -	92-275 0410	25	5.3	5.3	5.3	-131.5	-10.1	15.6	-131.5	-10.2	15.6	BL/MS	= 34
92-275 0410 -	92-275 0602	112	4.3	4.8	5.3	-131.5	-10.2	15.6	-131.4	-10.4	15.5	BL	= 33
92-275 0602 -	92-275 0610	8	4.3	4.3	4.3	-131.4	-10.4	15.5	-131.4	-10.4	15.5	BL/MS	= 34
92-275 0610 -	92-275 0722	72	4.3	4.3	4.3	-131.4	-10.4	15.5	-131.3	-10.5	15.5	BL	= 33
92-275 0722 -	92-275 0735	13	4.3	4.3	4.3	-131.3	-10.5	15.5	-131.3	-10.5	15.5	MS/BL	= 43
92-275 0735 -	92-275 0749	14	4.3	4.3	4.3	-131.3	-10.5	15.5	-131.2	-10.5	15.5	BL	= 33
92-275 0750 -	92-275 0947	117	3.3	3.8	4.3	-131.2	-10.5	15.5	-131.1	-10.7	15.5	MS	= 44
92-275 0948 -	92-275 1002	14	3.3	3.3	3.3	-131.1	-10.8	15.5	-131.1	-10.8	15.5	BL	= 33
92-275 1002 -	92-275 1007	5	3.3	3.3	3.3	-131.1	-10.8	15.5	-131.1	-10.8	15.5	MS/BL	= 43
92-275 1007 -	92-275 1017	10	3.3	3.3	3.3	-131.1	-10.8	15.5	-131.1	-10.8	15.5	MS	= 44
92-275 1017 -	92-275 1019	2	3.3	3.3	3.3	-131.1	-10.8	15.5	-131.0	-10.8	15.5	MS/BL	= 43
92-275 1019 -	92-275 1022	3	3.3	3.3	3.3	-131.0	-10.8	15.5	-131.0	-10.8	15.5	BL	= 33
92-275 1022 -	92-275 1030	8	3.3	3.3	3.3	-131.0	-10.8	15.5	-131.0	-10.8	15.5	MS/BL	= 43
92-275 1030 -	92-275 1102	32	3.3	3.3	3.3	-131.0	-10.8	15.5	-131.0	-10.9	15.4	Gap	= 1

Abbreviations were used throughout the characterization for the sake of briefness:

Abbr	Description
BL	Boundary Layer: mantle here; high B(>5g), +Bx(>4g), low dB, no EM waves
BS	Bow Shock: [similar to SW]
Cal	Calibration period
d(cs)	distance to current sheet
FF	Fast Flow event [similar to PS]
FL	Flare, used when there is some flare background
FR	Flow Reversal
LB	Lobe: mostly < 1 keV ions
MG	Magnetosphere: ions > 1-5 keV, 1-10 keV electrons (e-) [similar to PS]
MS	Magnetosheath: low B (<5g), -Bx, high dB, EM waves, 1+ keV ions
PS	Plasma Sheet: 100 eV+ ions, < ~1 keV electrons (e-)
RF	Reduced Flow (sec p. 3)
Rot	B rotation without boundary in plasma
RTO	Repeated Transient Observations
Sat	"saturated" plasma instrument readout(s); data was difficult to interpret
SW	Solar Wind
Gap	No ID available due to a Gap in the data record
?	Unknown
No_ID	No ID characterizes the period

GEOTAIL Magnetospheric Regime Identification References

When utilizing this plasma regime identification list in a publication, it is requested that two Journal of Geophysical Research papers be referenced:

1. Eastman, T. E., S. P. Christon, et al., Magnetospheric plasma regimes using Geotail measurements 1: Regime identification and distant tail variability, J. Geophys. Res., 103, 23,503-23,520, doi: , 1998.
2. Christon, S. P., T. E. Eastman, et al., Magnetospheric plasma regimes using Geotail measurements 2: Statistics, spatial distribution, and geomagnetic dependence, J. Geophys. Res., 103, 23,521-23,542, doi: , 1998.

These complementary papers together describe the RID identification process (paper 1) and the overall characteristics of the RID data set (paper 2). Neither paper is truly complete without the other. Typical referencing would be to cite both papers in the text where you first utilize the information.

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EPIC 12-hr color plots (D. Williams, PI)