



Research article

The temporal and spatial development of dB/dt for substorms

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Appendix

Table 2. Auroral and midlatitude bay substorm onset date (columns 1–3), time (columns 4–6), geographic latitude and longitude (columns 7,8), and minimum AL, minimum Sym-H, and minimum Dst identified between 10 min before the onset time and 60 min after the onset time (columns 9–11).

Year	Month	Day	Hour	Minute	Second	GeoLat.	GeoLong.	Min. AL	Min. Sym-H	Min. Dst
2008	01	08	08	30	30	65.00	-125.00	-579	-29	-22
2008	01	18	05	46	03	62.00	-100.00	-235	-24	-8
2008	01	18	07	45	30	63.00	-120.00	-494	-27	-14
2008	01	26	09	26	33	69.00	-142.00	-402	-24	-19
2008	01	29	08	32	12	65.00	-135.00	-242	-22	-13
2008	03	03	04	53	09	60.00	-87.00	-261	-17	-27
2008	03	03	09	35	45	67.00	-138.00	-360	-17	-18
2008	03	11	05	54	02	58.00	-100.00	-563	-26	-28
2008	03	14	02	34	15	58.00	-65.00	-267	-17	-17
2008	03	27	07	01	45	55.00	-115.00	-721	-38	-39
2008	03	29	04	25	21	59.00	-80.00	-324	-18	-25

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Year	Month	Day	Hour	Minute	Second	GeoLat.	GeoLong.	Min. AL	Min. Sym-H	Min. Dst
2008	04	06	06	10	39	53.00	-103.00	-691	-36	-31
2008	04	06	09	31	00	67.00	-140.00	-952	-25	-25
2008	04	07	04	50	57	54.00	-94.00	-500	-19	-21
2008	04	23	05	38	42	54.00	-98.00	-500	-37	-31
2008	04	27	06	17	42	57.00	-112.00	-299	-7	-18
2008	04	29	04	39	30	59.00	-90.00	-260	-8	-18
2008	05	04	07	16	33	61.00	-122.00	-630	-23	-16
2008	08	11	04	48	36	59.00	-94.00	-248	-18	-15
2008	08	14	04	26	57	56.00	-90.00	-464	-17	-17
2008	09	04	01	34	12	60.00	-60.00	-895	-50	-29
2008	09	05	03	12	06	59.00	-75.00	-254	-30	-29
2008	10	05	06	42	45	60.00	-112.00	-248	-17	-7
2008	11	09	00	09	33	62.00	-44.00	-864	-28	-13
2008	12	31	10	18	39	65.00	-150.00	-662	-11	3
2009	04	11	06	20	48	59.00	-102.00	-242	-17	-11
2009	04	21	06	52	06	62.00	-112.00	-206	-5	1
2009	09	16	03	03	09	60.00	-75.00	-161	-3	0
2009	09	27	09	58	27	65.00	-152.00	-684	-21	-16
2009	10	30	09	20	24	65.00	-148.00	-456	-43	-19
2009	11	15	06	17	30	59.00	-100.00	-149	-6	-3
2010	02	02	09	00	11	67.00	-140.00	-358	-20	-20
2010	02	16	07	18	17	60.00	-123.00	-572	-46	-42
2010	03	12	04	41	42	58.00	-85.00	-401	-20	-18
2010	03	18	03	26	03	57.00	-75.00	-161	-26	-15
2010	03	20	04	19	45	58.00	-90.00	-265	-10	-7
2010	04	02	07	18	27	59.00	-125.00	-277	-27	-15
2010	04	04	06	54	00	58.00	-110.00	-812	-22	-21
2010	04	12	06	53	15	56.00	-115.00	-368	-47	-44
2010	04	15	03	13	27	55.00	-77.00	-496	-35	-35
2010	04	15	06	40	12	60.00	-115.00	-197	-29	-29
2010	09	06	04	46	32	57.00	-85.00	-588	-16	-7
2010	09	25	02	40	24	61.00	-70.00	-241	-20	-16
2010	10	17	06	33	48	56.00	-108.00	-950	-44	-29
2010	11	11	09	59	06	68.00	-155.00	-918	-20	-16
2010	11	12	09	31	39	67.00	-150.00	-591	-32	-21
2011	01	14	08	18	54	65.00	-135.00	-465	-18	-15
2011	02	02	02	13	09	57.00	-65.00	-214	-16	-8
2011	03	02	03	52	51	57.00	-83.00	-336	-49	-40
2011	03	07	03	41	15	58.00	-75.00	-209	-8	-7
2011	03	11	06	15	51	53.00	-110.00	-651	-88	-78
2011	03	23	05	48	27	55.00	-100.00	-575	-15	-8

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Year	Month	Day	Hour	Minute	Second	GeoLat.	GeoLong.	Min. AL	Min. Sym-H	Min. Dst
2011	04	03	07	14	36	62.00	-120.00	-514	-40	-28
2011	04	06	10	26	54	64.00	-163.00	-799	-22	-21
2011	04	12	06	01	03	57.00	-110.00	-993	-29	-32
2011	04	14	05	34	45	59.00	-100.00	-211	-25	-20
2011	04	30	06	47	45	56.00	-115.00	-442	-27	-27
2011	05	02	06	45	54	55.00	-118.00	-799	-55	-43
2011	05	04	07	02	18	62.00	-110.00	-361	-14	-16
2011	08	22	07	34	24	61.00	-122.00	-298	-1	-6
2011	09	28	04	56	18	53.00	-90.00	-478	-64	-56
2011	10	02	05	25	03	58.00	-100.00	-339	-17	-24
2011	10	08	06	19	03	62.00	-104.00	-236	-3	-6
2011	10	21	03	41	51	55.00	-79.00	-281	-13	-17
2011	12	03	07	52	41	57.00	-125.00	-747	-34	-28
2012	01	09	07	57	30	61.00	-121.00	-282	-8	2
2012	03	03	03	31	15	58.00	-75.00	-403	-25	-34
2012	03	16	09	01	18	63.00	-145.00	-1124	-52	-52
2012	03	18	04	53	05	55.00	-97.00	-454	-39	-44
2012	03	28	06	53	26	54.00	-122.00	-301	-56	-52
2012	04	12	04	34	30	56.00	-93.00	-383	-10	-12
2012	04	17	06	45	03	61.00	-107.00	-384	-5	-8
2012	04	25	10	10	30	64.00	-150.00	-487	-50	-49
2012	04	26	04	33	30	57.00	-90.00	-327	-34	-27
2012	05	09	05	33	30	54.00	-105.00	-213	-41	-28
2012	05	20	05	01	24	53.00	-95.00	-731	-28	-17
2012	10	09	06	43	48	56.00	-120.00	-1408	-110	-99
2012	11	14	08	18	33	58.00	-130.00	-1146	-107	-96
2012	11	18	09	11	21	67.00	-135.00	-406	-12	-10
2012	12	15	03	05	33	59.00	-75.00	-206	-7	7
2012	12	18	09	01	18	67.00	-135.00	-597	-18	1



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