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UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

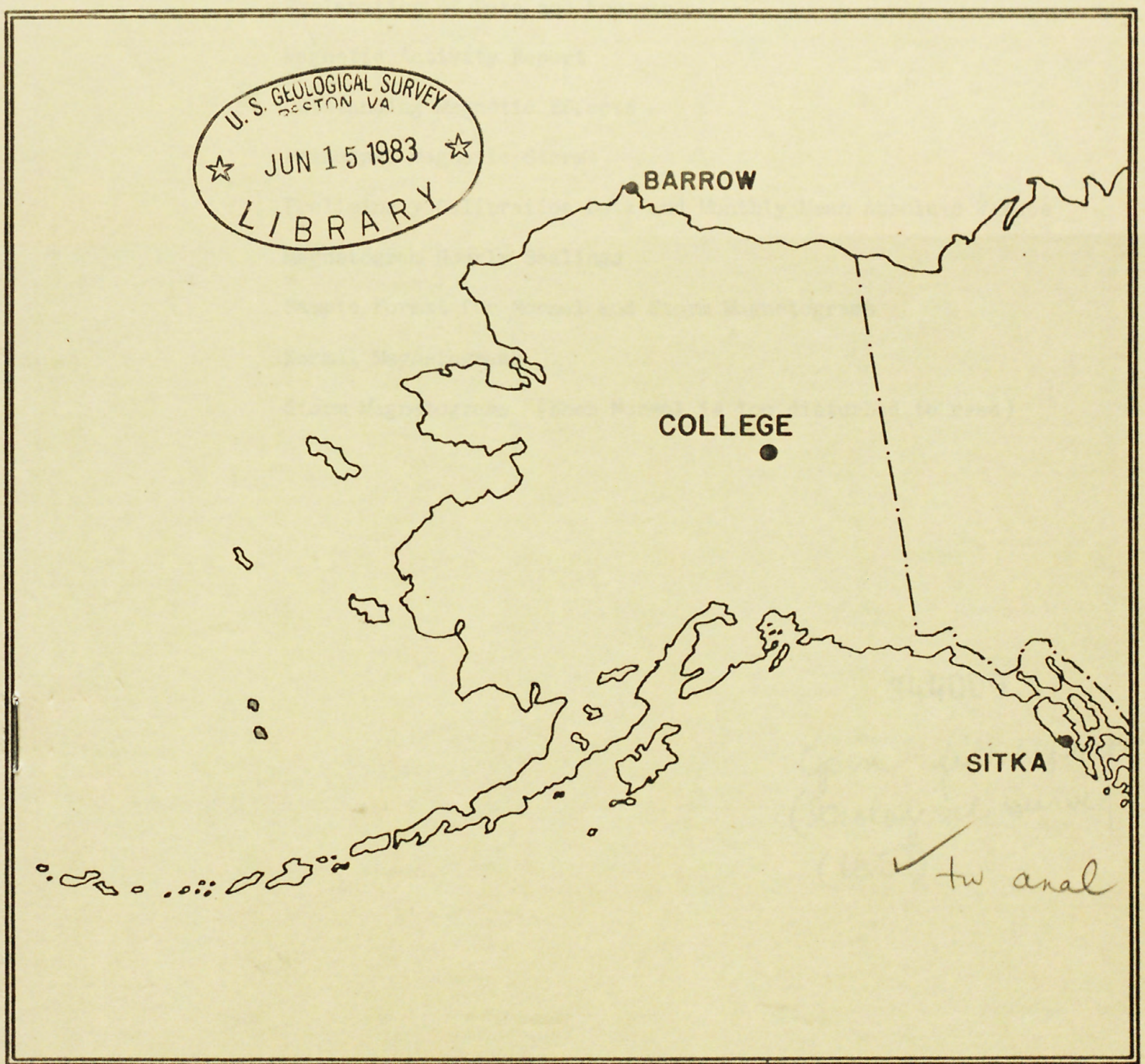
PRELIMINARY GEOMAGNETIC DATA

COLLEGE OBSERVATORY

FAIRBANKS, ALASKA

APRIL 1983

OPEN FILE REPORT 83-0300D





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THIS REPORT WAS PREPARED UNDER THE DIRECTION OF JOHN B. TOWNSEND, CHIEF OF THE COLLEGE OBSERVATORY, WITH THE ASSISTANCE OF THE OBSERVATORY STAFF MEMBERS: J.E. PAPP, E.A. SAUTER, L.Y. TORRENCE, T.K. CUNNINGHAM AND IN COOPERATION WITH THE GEOPHYSICAL INSTITUTE OF THE UNIVERSITY OF ALASKA. THE COLLEGE OBSERVATORY IS A PART OF THE BRANCH OF GLOBAL SEISMOLOGY AND GEOMAGNETISM OF THE U.S. GEOLOGICAL SURVEY.

Explanation of Data and Reports

Magnetic Activity Report

Outstanding Magnetic Effects

Principal Magnetic Storms

Preliminary Calibration Data and Monthly Mean Absolute Values

Magnetogram Hourly Scalings

Sample Format for Normal and Storm Magnetograms

Normal Magnetograms

Storm Magnetograms (When Normal is too disturbed to read)

344000

*Open-file report
(Geological Survey
(U.S.))*

COLLEGE OBSERVATORY PRELIMINARY GEOMAGNETIC DATA

EXPLANATION OF DATA AND REPORTS

INTRODUCTION

The preliminary geomagnetic data included here is made available to scientific personnel and organizations as part of a cooperative effort and on a data exchange basis because of the early need by some users. To avoid delay, all of the data is copied from original forms processed at the observatory; therefore it should be regarded as preliminary. Inquiries about this report or about the College Observatory should be addressed to:

Chief, College Observatory
U.S. Geological Survey
800 Yukon Drive
Fairbanks, Alaska 99701

Requests for copies of the magnetograms except for the current month should be addressed to:

World Data Center A
NOAA D63, 325 Broadway
Boulder, Colorado 80303

OBSERVATORY LOCATION

The College Observatory, operated by the U.S. Geological Survey, is located at the University of Alaska, Fairbanks, Alaska. It is near the Auroral Zone and the northern limit of the world's greatest earthquake belt, the circum-Pacific Seismic belt. Although the observatory's basic operation is in geomagnetism and seismology, it cooperates with other scientists and organizations in areas where the facility and personnel can be of service.

The observatory is one of three operated by the USGS in Alaska. The others are located at Barrow and Sitka.

The position of the observatory site is:
Geographic latitude..... $64^{\circ}51.6'N$
Geographic longitude..... $147^{\circ}50.2'W$
Geomagnetic latitude..... $+64.6^{\circ}$
Geomagnetic longitude..... $+256.5^{\circ}$
Elevation.....200 meters

GEOMAGNETIC DATA

Normal, Storm and Rapid Run magnetograms and appropriate calibration data are processed daily at the observatory and are available for analysis or copying. Also available, are mean hourly scalings, K-Indices, selected magnetic phenomena reports and on a real-time basis are recordings from a 3-component fluxgate magnetometer and F-component proton magnetometer.

Magnetic Activity

The K-Index: The K-Index is a logarithmic measurement of the range of the most disturbed component (D or H) of the geomagnetic field for eight intervals beginning 0000-0300, 0300-0600...2100-2400 UT. It is a measure of the difference between the highest and lowest deviation from a smooth curve to be expected for a component on a magnetically quiet day, within a three hour interval.

The Equivalent Daily Amplitude, AK: The K-Index is converted into an equivalent range, ak, which is near the center of the limiting gamma ranges for a given K. The average of the eight values is called equivalent daily amplitude AK. The unit 10γ has been chosen so as not to give the illusion of an accuracy not justified.

The schedule for converting gamma range to K, and K to ak is as follows:

Gamma Range	K - Index	ak
0 < 25	0	0
25 < 50	1	3
50 < 100	2	7
100 < 200	3	15
200 < 350	4	27
350 < 600	5	48
600 < 1000	6	80
1000 < 1650	7	140
1650 < 2500	8	240
2500+	9	400 (10γ)

The Magnetic Daily Character Figure, C: To each Universal day a character is assigned on the basis C=0, if it is quiet; C=1, if it is moderately disturbed; C=2, if it is greatly disturbed. The method used to assign characters at the College Observatory is based on AK as follows:

AK Range	C
0 ≈ 11	0
11 ≈ 50	1
50+	2

Routine assignment of C was discontinued at College on January 1, 1976.

Selected Phenomena & Outstanding Magnetic Effects

Prior to January 1, 1976, the Normal and Rapid Run records were reviewed at the observatory for selected magnetic phenomena and the events identified were forwarded to the IUGG Commission on Magnetic Variations and Disturbances. This was discontinued on January 1, 1976, but a report on Outstanding Magnetic Effects is prepared monthly for this report.

Principal Magnetic Storms

Gradual and sudden commencement magnetic disturbances with at least one K-Index of 5 or greater, which are believed to be part of a world-wide disturbance, are classified as principal magnetic storms. The time of the storm beginning and ending; direction and amplitude of sudden commencements; period of maximum activity; and storm range are reported. Monthly reports of these data are forwarded to the World Data Center A in Boulder, Colorado.

Magnetogram Hourly Scalings

Magnetogram hourly scalings are averages for successive periods of one hour for the D, H and Z elements. The Value in the column headed "01" is the average for the hour beginning 0000 and ending 0100. Note that the values on the scaling sheets are in tenths of mm with the decimal point omitted. The user of these scalings should keep in mind that the tabular values are hourly means and if he is interested in the detailed morphology of the magnetic field, he should refer directly to the magnetograms.

Magnetograms

The normal magnetograms in this report are reproduced at about one-third the size of the originals. Preliminary base-line values and scale values adopted for use with the original magnetograms are included. For days when the magnetic field is too disturbed for the Normal magnetogram to be readable, Storm magnetograms are reproduced.

Absolutes, Base-lines and Scale Values

To determine the absolute value of the magnetic field from the hourly means or from point scalings the following equations should be used:

$$D = B_D + d \cdot S_D; H = B_H + h \cdot S_H; Z = B_Z + z \cdot S_Z$$

where D, H and Z are absolute values;
 B_D , B_H and B_Z are base-line values;
 S_D , S_H and S_Z are scale values;
and d, h and z are scalings in millimeters.

MAGNETIC ACTIVITY

(Greenwich civil time, counted from midnight to midnight)

MONTH AND YEAR

APRIL 1983

DATE	K-INDICES									AK	TIME SCALE ON MAGNETOGRAMS 20 mm/hr
	00-03	03-06	06-09	09-12	12-15	15-18	18-21	21-24	SUM		
1	3	5	4	6	5	5	3	2	33	36	SUDDEN COMMENCEMENTS d h m
2	3	3	3	5	3	4	2	2	25	19	
3	2	3	3	5	6	1	1	2	23	22	
4	2	3	4	5	3	4	5	2	28	24	
5	3	3	3	4	4	3	1	1	22	15	
6	3	4	6	5	6	5	4	3	36	43	
7	3	4	4	7	6	5	4	4	37	49	
8	4	4	4	5	7	4	3	2	33	40	
9	2	3	3	5	4	5	3	3	28	24	
10	3	3	4	5	4	3	2	3	27	21	
11	3	2	3	2	0	1	1	1	13	07	
12	3	2	4	5	4	4	2	2	26	21	
13	4	5	5	6	7	4	3	3	37	50	
14	4	4	6	5	5	5	4	5	38	44	
15	5	5	7	6	6	6	5	3	43	67	
16	5	5	4	7	6	5	4	4	40	56	
17	3	2	5	4	3	5	4	3	29	25	
18	3	3	2	4	4	4	2	1	23	16	
19	1	3	3	6	5	5	2	1	26	27	
20	3	3	4	4	5	4	3	2	28	23	
21	4	3	4	3	4	2	2	3	25	18	
22	3	4	5	6	2	2	1	0	23	23	
23	2	3	5	4	4	2	2	3	25	19	
24	3	4	5	7	5	6	6	4	40	58	
25	5	4	4	6	5	5	4	5	38	44	
26	4	4	4	5	6	6	2	2	33	38	
27	4	4	4	4	4	4	1	2	27	22	
28	4	3	3	4	5	2	2	1	24	19	
29	2	3	5	5	7	6	6	3	37	54	
30	3	4	7	5	4	5	3	3	34	42	
31											

POSSIBLE SOLAR-FLARE
EFFECTS BASED ON
INSPECTION OF GRAMS
ALONE (WITHOUT
REFERENCE TO DATA
FROM OTHER SOURCES)

BEGIN

END

d h m

d h m

K SCALE USED:

LOWER LIMIT FOR K = 9.....

D

H

Z

683.8

321.7

CURRENT SCALE VALUE.....

3.73

7.76

LOWER LIMIT FOR K = 9.....

2550

2500

(mm)

(γ /mm)

(to nearest 10 γ)

SCALINGS AND COMPUTATIONS HAVE BEEN CHECKED.

APPROVED JOHN B. TOWNSHEND, CHIEF, COLLEGE OBSERVATORY

OBSERVER IN CHARGE

OUTSTANDING MAGNETIC EFFECTS

OBSERVATORY
COLLEGE, ALASKA

MONTH
APRIL

YEAR
1983

DATE	TIME U.T.	NATURE OF PHENOMENON ¹	REMARKS
06	0005	ssc*	
18	10xx	pi 2	

IDENTIFIED BY: JEP

VERIFIED BY: EAS

1. NATURE OF PHENOMENON: ssc, ssc*, si, si*, b, bp, bs, bps, pc1, pc2 - - - pc5, pg, pi 1, pi 2, sfe.

PRINCIPAL MAGNETIC STORMS

WDC-A FOR SOLAR-TERRRESTRIAL PHYSICS
ENVIRONMENTAL DATA SERVICE, NOAA
BOULDER, COLORADO 80502 U.S.A.

Data from Individual Observatories: COLLEGE OBSERVATORY, COLLEGE, ALASKA
APRIL 1983

Obs. 2 letter IAGA code	Geomag. lat.	Commencement			SC - amplitudes			Max. 3 hr - index K			Ranges			UT End day hr	
		day	hr min (UT)	type	D(')	H(γ)	Z(γ)	day	(3 hr - period)	K	D(')	H(γ)	Z(γ)		
CO	64°6 N	06	0005	s.c.*	-6	+30	..	07	4	7	209	1740	1040	09 00	
								08	5	7					
		13	00XX	..	..	..	..	..	13	5	7	234	1470	1090	18 05
									15	3	7				
									16	4	7				
		23	20XX	..	..	..	..	..	24	4	7	214	1450	850	27 17
		29	03XX	..	..	..	..	..	29	5	7	163	1310	980	May 01 14
									30	3	7				

NORMAL MAGNETOGRAPH					
COMPONENT	PERIOD		CALIBRATION		
	FROM	TO	SCALE VALUE		BASELINE
D	0000 U.T., 4-1-83	2400 U.T., 4-30-83	1'.0/mm	3.7 γ /mm	27° 46'.8 E
H	0000 U.T., 4-1-83	1831 U.T., 4-15-83	7.8 γ /mm		12759 γ
	1832 U.T., 4-15-83	2400 U.T., 4-24-83	"		12756 γ
	0000 U.T., 4-25-83	2400 U.T., 4-30-83	"		12762 γ
Z	0000 U.T., 4-1-83	1831 U.T., 4-15-83	7.7 γ /mm		55150 γ
	1832 U.T., 4-15-83	2400 U.T., 4-24-83	"		55129 γ
	0000 U.T., 4-25-83	2400 U.T., 4-30-83	"		55140 γ

STORM MAGNETOGRAPH					
COMPONENT	PERIOD		CALIBRATION		
	FROM	TO	SCALE VALUE		BASELINE
D	0000 U.T., 4-1-83	1831 U.T., 4-15-83	7'.9/mm	29.6 γ /mm	23° 41'.3 E
	1832 U.T., 4-15-83	2400 U.T., 4-30-83	"	"	24° 21'.1 E
H	0000 U.T., 4-1-83	1831 U.T., 4-15-83	43.9 γ /mm		11517 γ
	1832 U.T., 4-15-83	2400 U.T., 4-30-83	"		10808 γ
Z	0000 U.T., 4-1-83	1831 U.T., 4-15-83	48.4 γ /mm		54088 γ
	1832 U.T., 4-15-83	2400 U.T., 4-30-83	"		54108 γ

RAPID RUN MAGNETOGRAPH					
COMPONENT	PERIOD		CALIBRATION		
	FROM	TO	SCALE VALUE		
D					
H					
Z					

MONTHLY MEAN ABSOLUTE VALUES*		
D	H	Z
27° 52'.4 E	12955 γ	55388 γ

* COMPUTED FROM ^{FIVE} ~~TEN~~ QUIETEST DAYS DURING MONTH. **

DAYS USED: APR. 2, 5, 11, 18, 21, _____, _____, _____, _____

** NOTE: DUE TO VERY DISTURBED MAGNETIC CONDITIONS DURING THE MONTH OF APRIL 1983, ONLY 5 DAYS ARE USED TO COMPUTE THE MONTHLY MEAN ABSOLUTE VALUES.

FORM 76-106

MAGNETOGRAM HOURLY SCALINGS
(UNIVERSAL TIME)U.S. DEPARTMENT OF INTERIOR
Geological Survey, Geologic Division
Denver Federal Center
DENVER, CO 80225OBSY. YEAR MONTH ELEMENT
CO 83 APR DValues are in tenths of mm. and are averages for successive periods of one hour beginning at midnight, Hour 01 of local day (150 M.T.) is hour 11 of the same universal day.
Shrinkage corrections have been applied. Negative values are in red, with minus signs shown.

C	Q	Tea	Hr	01	02	03	04	05	06	07	08	09	10	11	12	Hr	13	14	15	16	17	18	19	20	21	22	23	24	SUM	
			01	50	32	13	16	94	55	70	-138	-107	-99	84	-11	01	44	195	230	293	218	135	158	90	59	67	101	63	1712	
			02	49	33	-2	-31	-2	-29	42	-16	36	58	66	128	02	50	58	153	259	86	58	65	62	71	36	52	41	1323	
			03	50	14	-18	-65	72	-58	20	66	38	44	72	74	03	53	113	101	92	88	107	110	93	106	100	24	4	1300	
			04	-8	-22	-37	-70	-31	154	-50	-46	14	-6	85	85	04	178	112	235	234	262	404	406	101	-8	40	24	52	2108	
			05	2	2	-4	26	16	-20	41	15	20	27	47	102	05	120	148	136	121	63	90	83	90	84	84	82	60	1435	
			06	32	6	-20	10	18	59	49	18	-233	-145	74	219	06	124	315	283	208	176	172	109	44	18	22	34	43	1635	
			07	33	-5	-8	27	-8	88	69	44	36	-2	-51	346	07	-42	152	151	289	156	137	103	71	66	52	100	53	1857	
			08	33	37	34	-15	-27	80	99	63	41	75	122	96	08	371	257	132	217	173	96	95	114	96	82	74	56	1887	
			09	44	25	36	14	17	56	38	41	165	6	120	74	09	166	173	178	198	263	97	86	99	81	78	68	49	2172	
			10	50	22	49	60	49	73	162	52	223	51	66	164	10	11	86	118	134	99	108	89	84	36	68	42	55	1951	
			11	24	21	30	35	24	52	36	74	136	37	40	59	11	69	69	89	108	122	127	127	115	72	34	34	28	1562	
			12	6	1	46	29	60	66	66	63	48	-51	102	101	12	76	86	100	65	173	142	79	94	51	39	28	23	1493	
			13	0	10	-40	38	51	109	9	51	-25	-74	43	77	13	69	116	108	115	160	230	205	125	8	81	77	10	1553	
			14	-39	-72	-96	-154	-217	-47	-26	37	-98	-129	-82	204	14	219	148	529	394	312	300	68	100	65	-67	-41	-11	1297	
			15	258	64	-82	-114	-122	7	-42	-98	-82	-98	100	44	15	27	140	188	426	379	204	286	32	38	32	28	28	1643	
			16	50	-18	-36	-37	-74	-15	24	-90	-38	-18	45	-34	16	69	387	108	292	218	230	96	60	80	125	116	58	1598	
			17	-10	-16	7	-36	28	13	79	24	135	-15	22	46	17	79	85	96	96	288	236	204	118	74	-14	6	37	1582	
			18	13	-24	-1	-40	45	46	4	26	36	31	39	49	18	106	85	106	216	177	122	150	142	54	25	52	24	1483	
			19	18	22	15	14	-14	13	43	36	-24	-121	30	79	19	196	213	379	426	331	213	152	104	93	86	55	22	2381	
			20	-17	-29	-24	-48	-48	4	42	28	40	-2	44	-2	20	106	93	205	230	244	264	205	62	16	-20	46	32	1471	
			21	-13	-35	-52	-46	0	-22	-39	-9	55	34	30	45	21	90	98	93	122	146	134	127	106	108	56	33	-2	1059	
			22	-6	4	-72	-79	-113	-121	-209	-273	-177	-98	72	62	22	82	101	118	120	124	133	125	98	77	59	26	-9	44	
			23	-19	-38	-38	-25	-100	-42	-7	44	-93	-45	19	82	23	65	78	145	152	166	185	184	174	136	146	13	-76	1106	
			24	-36	-64	-106	-124	-157	-77	-52	-26	-85	-21	121	169	24	201	162	120	551	149	495	243	161	182	33	-11	74	1902	
			25	58	12	-47	-20	6	-29	52	21	44	32	18	-21	25	35	53	188	352	304	273	-14	36	117	102	28	126	1726	
			26	33	14	-3	-70	29	-65	353	-23	26	-82	134	98	26	92	320	224	526	153	150	150	140	130	110	38	34	2511	
			27	-13	0	18	-66	-46	100	19	72	-1	42	50	0	27	13	100	159	164	111	156	145	129	89	85	46	22	1394	
			28	-1	-30	-61	24	-52	-38	18	16	28	73	35	29	28	-40	40	116	131	132	168	120	81	71	65	27	6	958	
			29	0	-28	-21	-65	-112	-50	-37	2	-40	3	12	47	29	151	404	182	262	301	198	213	158	24	35	-56	-20	1563	
			30	-24	-46	-23	16	-49	31	-24	-120	-207	-65	-96	24	30	86	146	101	354	176	158	144	115	97	66	59	29	948	
			31													31														

SCALED BY
CHECKED BY
SIGNS RE-
VIEWED BY
PUNCHED BY

LYT

TKC, JEP

JEP

Preliminary base-line and scale values:

Interval
BeginningBase-line
ValueScale
Value

() Interpolated

[] Significant portion of
hour interpolated.□ No record; or no values
available because of
faulty record.

* Derived from STORM Mgh., converted to Normal Mgh.

[] Scaling uncertain because
of magnetic storm.<> Record off sheet for part
or all of hour; if value is
given, curve was estimated
for missing part.

MONTHLY SUM 46654

MONTHLY MEAN 65

DATES WITH GAPS:

FORM 76-106

MAGNETOGRAM HOURLY SCALINGS
(UNIVERSAL TIME)U.S. DEPARTMENT OF INTERIOR
Geological Survey, Geologic Division
Denver Federal Center
DENVER, CO 80225OBSY. YEAR MONTH ELE-
CO 83 APR ZValues are in tenths of mm. and are averages for successive periods of one hour beginning at midnight. Hour (1) of local day (150 N.T.) is hour 11 of the same universal day.
Shrinkage corrections have been applied. Negative values are in red, with minus signs shown.

C	Q or S	T or O	HT EM	01	02	03	04	05	06	07	08	09	10	11	12	HT EM	13	14	15	16	17	18	19	20	21	22	23	24	SUM	
				01	337	344	356	372	348	356	254	189	166	167	232*	375	01	329	194	279	345	208	225	298	294	290	318	342	341	7029
				02	340	358	338	352	368	360	366	298	348	368	241	214	02	271	304	270	254	255	172	197	248	304	307	313	322	7168
				03	359	351	341	344	392	376	386	363	365	334	328	325	03	227	205	279	290	305	317	321	315	320	322	325	344	7834
				04	346	350	366	376	390	379	379	374	340	318	498	416	04	336	340	322	331	184	143	233	128	180	283	301	318	7631
				05	316	363	373	371	332	353	353	289	258	280	330	356	05	361	302	265	253	282	276	295	294	298	304	308	314	7526
				06	317	314	342	377	385	374	385	314	392	502	423	703*	06	697*	445*	461	410	356	274	238	287	310	326	331	341	9304
				07	337	358	377	364	365	370	380	342	172	224	261	60*	07	59	207	268	380	282	258	232	304	324	325	362	363	6974
				08	330	341	336	334	360	382	308	250	214	261	268	322	08	565*	79*	221	192	216	220	264	276	293	297	301	293	6923
				09	300	304	308	301	308	350	306	252	202	239	273	137	09	189	304	297	284	250	217	257	265	268	295	302	326	6534
				10	336	320	339	329	312	358	328	310	106	150	241	242	10	158	239	245	232	250	277	283	288	278	293	304	328	6546
				11	311	307	312	322	311	318	298	320	280	259	305	270	11	278	286	294	297	294	292	296	298	290	288	294	296	7116
				12	293	300	324	313	310	304	308	303	292	123	217	215	12	266	246	265	262	224	188	240	266	268	280	284	303	6394
				13	314	341	344	366	308	327	333	310	284	314	316	562	13	539*	539*	368	230	275	290	274	252	190	237	258	273	7844
				14	287	322	301	318	292	193*	79*	38	124*	268	346	541	14	565*	397*	401*	326*	271	218	242	264	282	286	317	308	6986
				15	255*	271	311	306	186*	309	190	199	165	249	419*	665*	15	536	603	464*	401*	104*	-75	137	251	316	338	367	393	7360
				16	403	353	322	338	361	391	261	326	356	346	442	406	16	437	402	361	312	226	199	292	296	327	370	411	394	8332
				17	357	365	389	375	408	384	368	326	225	157	279	339	17	344	330	283	286	251	305	242	292	329	339	352	366	7691
				18	366	369	386	366	428	384	364	386	370	358	340	365	18	326	287	278	208	263	334	342	334	317	306	325	328	8130
				19	331	334	337	340	349	398	396	382	320	259	323	356	19	374	423	352*	301*	358*	228	320	334	327	336	337	345	8160
				20	346	373	372	384	411	440	420	371	252	298	335	322	20	366	386	317	315	242	160	246	226	259	290	328	346	7805
				21	366	388	386	350	389	367	278	345	400	359	341	340	21	287	244	259	308	329	324	329	316	320	322	328	328	8003
				22	369	387	389	399	342	215	94*	154	233	414	378	344	22	347	340	346	332	328	321	326	324	321	320	326	334	7683
				23	346	350	376	416	393	471	416	375	320	391	425	422	23	352	314	318	330	346	341	327	309	302	324	338	341	8643
				24	359	355	372	378	366	135	135	171	253	417	435*	323	24	605*	699*	655*	617*	239	189*	244	223	309	356	353	347	8535
				25	346	352	310	344	350	352	326	327	340	308	618	323	25	381	172	186	359*	428*	227*	176	234	295	318	387	393	7852
				26	393	362	358	348	391	338	239	152	293	354	473	457	26	434	287	372*	417*	286	267	307	322	324	333	346	345	8198
				27	348	352	376	337	348	384	354	330	186	320	325	248	27	195	207	229	277	242	269	304	320	313	316	316	314	7210
				28	338	338	360	384	379	421	427	395	361	325	298	288	28	246	214	222	244	300	309	296	297	295	291	282	279	7589
				29	305	331	335	314	333	371	362	336	241	363	406	386	29	548*	586*	706*	770*	819*	637*	497*	448*	200	350	339	330	10313
				30	357	368	351	363	315	283	254	145*	194	315	445	432	30	441	414	315	481	272	262	277	303	304	302	333	321	7847
				31												31														
SCALED BY	LYT			Preliminary base-line and scale values:													<input type="checkbox"/> Interpolated <input type="checkbox"/> Significant portion of hour interpolated. <input type="checkbox"/> No records; or no values available because of faulty record. <input checked="" type="checkbox"/> Derived from <u>STORM</u> Mgh., converted to Normal Mgh.				<input type="checkbox"/> Scaling uncertain because of magnetic storm. <input checked="" type="checkbox"/> Record off sheet for part or all of hour; if value is given, curve was estimated for missing part.				MONTHLY SUM	23160				
CHECKED BY	TAC, JEP			Interval Beginning	Base-line Value	Scale Value														MONTHLY MEAN	321									
SIGNS REVIEWED BY	JEP																DATES WITH GAPS:													
PUNCHED BY																														

MAGNETOGRAM HOURLY SCALINGS
(UNIVERSAL TIME)

U.S. DEPARTMENT OF INTERIOR
Geological Survey, Geologic Division
Denver Federal Center
DENVER, CO 80225

OBSY. YEAR MONTH ELEMENT
CO 83 APR H

Values are in tenths of mm. and are averages for successive periods of one hour beginning at midnight. Hour 01 of local day (150 M.T.) is hour 11 of the same universal day.
Shrinkage corrections have been applied. Negative values are in red, with minus signs shown.

C	Q or S	T or O	H or W	01	02	03	04	05	06	07	08	09	10	11	12	H or W	13	14	15	16	17	18	19	20	21	22	23	24	SUM	
			01	244	264	293	415	397	359	403	326	407	303	-260*	147*	01	50	-57	-2	-131	51	276	190	156	270	266	250	259	4876	
			02	276	274	298	296	303	361	387	466	390	309	197	70	02	222	182	148	-19	-8	160	220	234	255	242	241	250	5754	
			03	318	313	288	338	318	352	313	326	310	330	283	162	03	-180*	223	244	240	250	254	263	251	236	198	183	215	6028	
			04	233	252	276	339	414	374	504	493	413	363	68	-24	04	16	-6	-19	-35	-87	-112	-86	95	251	284	270	260	4536	
			05	297	352	339	279	266	364	376	372	331	344	253	123	05	125	40	165	217	234	258	250	277	267	257	233	230	6249	
			06	230	234	315	274	340	450	323	387	-130*	-130*	40	-108	06	-436*	-299*	-95*	124	93	104	210	290	276	257	244	247	3240	
			07	273	324	310	286	459	492	369	294	209	171	-111	-813	07	-72*	230	212	-99	57	185	138	255	245	227	231	218	4090	
			08	270	405	299	326	363	416	367	336	240	271	112	62	08	-366*	-314*	280	156	34	189	245	264	250	248	243	250	4946	
			09	258	267	240	264	274	297	273	340	354	289	173	-26	09	0	30	24	-114	-157*	202	258	236	232	235	236	279	4464	
			10	265	297	275	282	270	338	252	293	258	218	156	-122*	10	41	170	170	139	214	259	234	232	220	230	228	268	5187	
			11	240	255	274	280	276	259	248	299	288	281	272	240	11	266	264	263	256	252	253	246	239	225	228	232	222	6158	
			12	252	277	226	258	243	275	253	254	276	104	246	176	12	52	247	267	210	86	178	250	261	262	249	236	247	5385	
			13	256	314	359	282	442	394	321	332	240	342	292	-196*	13	-586*	-27	-106*	260	299	237	216	150	166	226	233	248	4694	
			14	335	442	465	498	661	602*	465*	246	131	30	115*	-106*	14	202	-253	-406*	-122*	-72*	-21	208	153	111	224	215	333	4052	
			15	545*	470	414	442	567*	398	200	-202	-72*	215	64	-213	15	22	-55*	-399	-610	445*	-9*	54	286	270	266	268	276	2752	
			16	414	382	555	419	529	394	308	338	365	130	-284*	-357*	16	-425*	-250*	2	-145	-108	145	235	186	255	216	315	279	3898	
			17	258	328	317	317	337	359	381	415	245	126	210	248	17	237	184	95	147	-210*	-22	48	211	148	226	242	256	5103	
			18	257	244	270	327	329	261	288	288	262	266	249	193	18	10	179	24	-33	169	222	230	188	194	223	230	223	5093	
			19	216	219	240	254	291	357	356	276	345	102	59	151	19	14	-81	-122	-125*	-63	229	287	269	246	228	219	199	4166	
			20	232	334	354	329	409	365	267	312	252	314	221	152	20	103	-75*	-72	49	68	126	143	114	198	202	221	253	4871	
			21	272	345	474	512	416	490	544	450	351	310	262	228	21	59	86	212	246	232	236	225	210	207	198	204	241	7010	
			22	369	430	391	490	584	595	568*	497	396	13	220	234	22	223	222	214	236	241	245	254	251	239	226	214	218	7570	
			23	232	219	246	299	354	408	490	440	311	80	208	85	23	-2	190	254	286	280	271	257	242	234	214	209	224	6031	
			24	278	303	283	370	426	446	508	426	239	-241*	-648*	-304*	24	-179*	51	76	-439*	19	-326*	-134*	91	199	223	279	367	2313	
			25	442	442	516	475	395	432	353	273	270	257	-321*	-168*	25	-207*	33	1	-135	-184*	-207*	74	135	166	168	288	369	3867	
			26	299	319	231	326	302	436	466	443	436	241	96	104	26	102	-479*	-603*	-371*	69	301	275	261	236	214	197	220	4121	
			27	322	436	295	288	394	270	252	260	165	267	239	56	27	23	166	132	46	167	243	252	229	219	205	205	210	5341	
			28	251	284	365	377	322	370	346	248	269	275	231	182	28	-79	101	102	246	260	225	218	215	222	211	208	217	5666	
			29	235	218	247	291	354	442	485	442	232	3	105	156	29	-174*	-626*	-309*	-264*	-378*	-655*	-343*	264*	56	196	217	280	946	
			30	309	316	308	238	316	440	442	64	115*	244	50	98	30	21	79	87	-191*	128	175	218	217	228	220	287	272	4683	
			31													31														

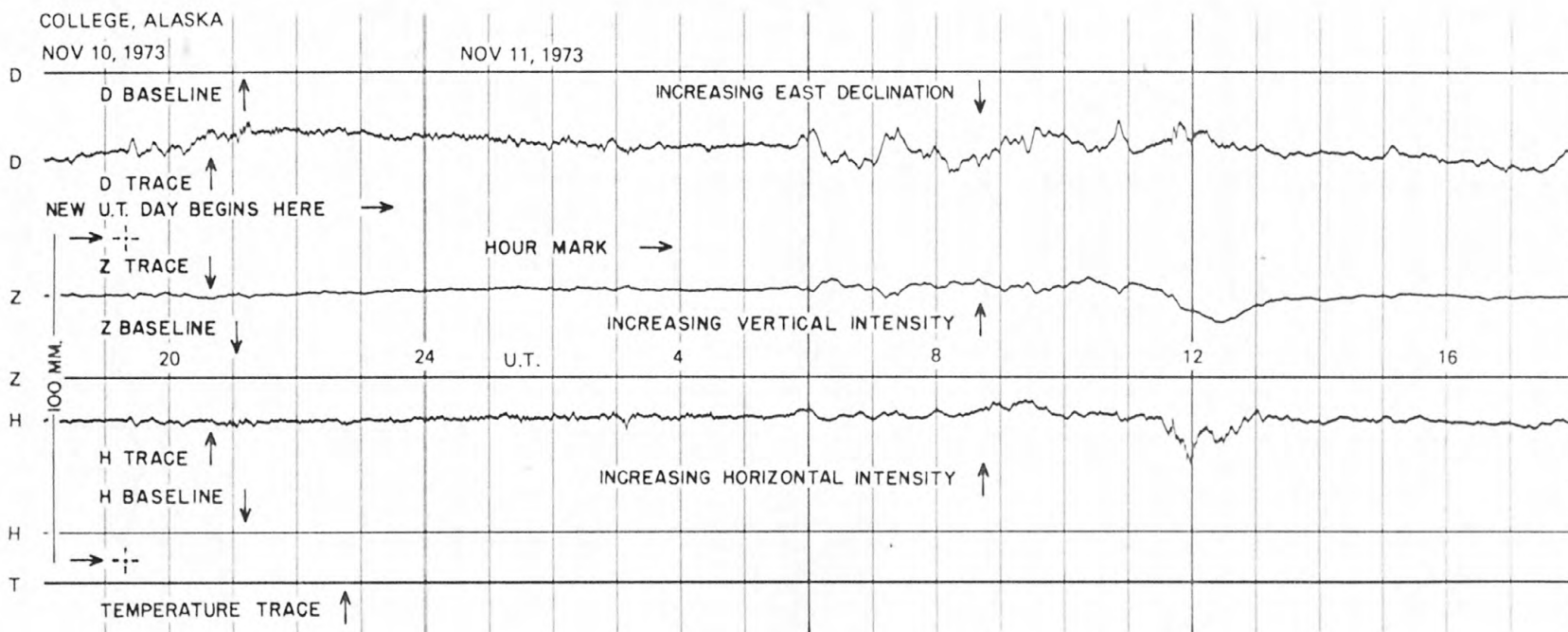
SCALED BY LYT
CHECKED BY TAC, JEP
SIGNS REVIEWED BY JEP
PUNCHED BY

Preliminary base-line and scale values:
Interval Beginning Base-line Value Scale Value

() Interpolated
() Significant portion of hour interpolated.
() No record; or no values available because of faulty record.
() Scaling uncertain because of magnetic storm.
(>) Record off sheet for part or all of hour; if value is given, curve was estimated for missing part.
* Derived from STORM Mgp., converted to Normal Mgp.

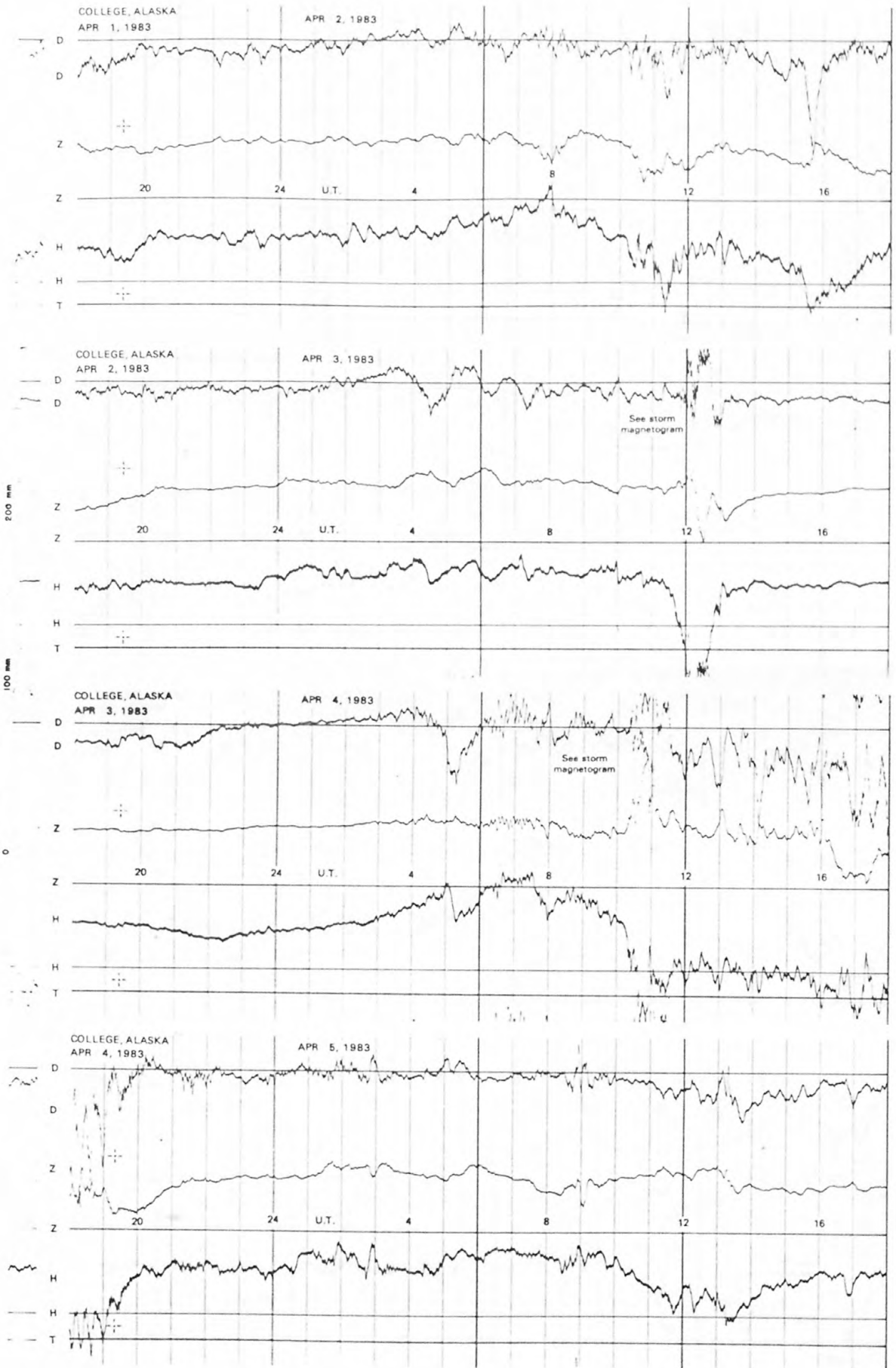
MONTHLY SUM 143090
MONTHLY MEAN 199
DATES WITH GAPS

FORMAT FOR NORMAL & STORM MAGNETOGRAMS (SAMPLE ONLY)

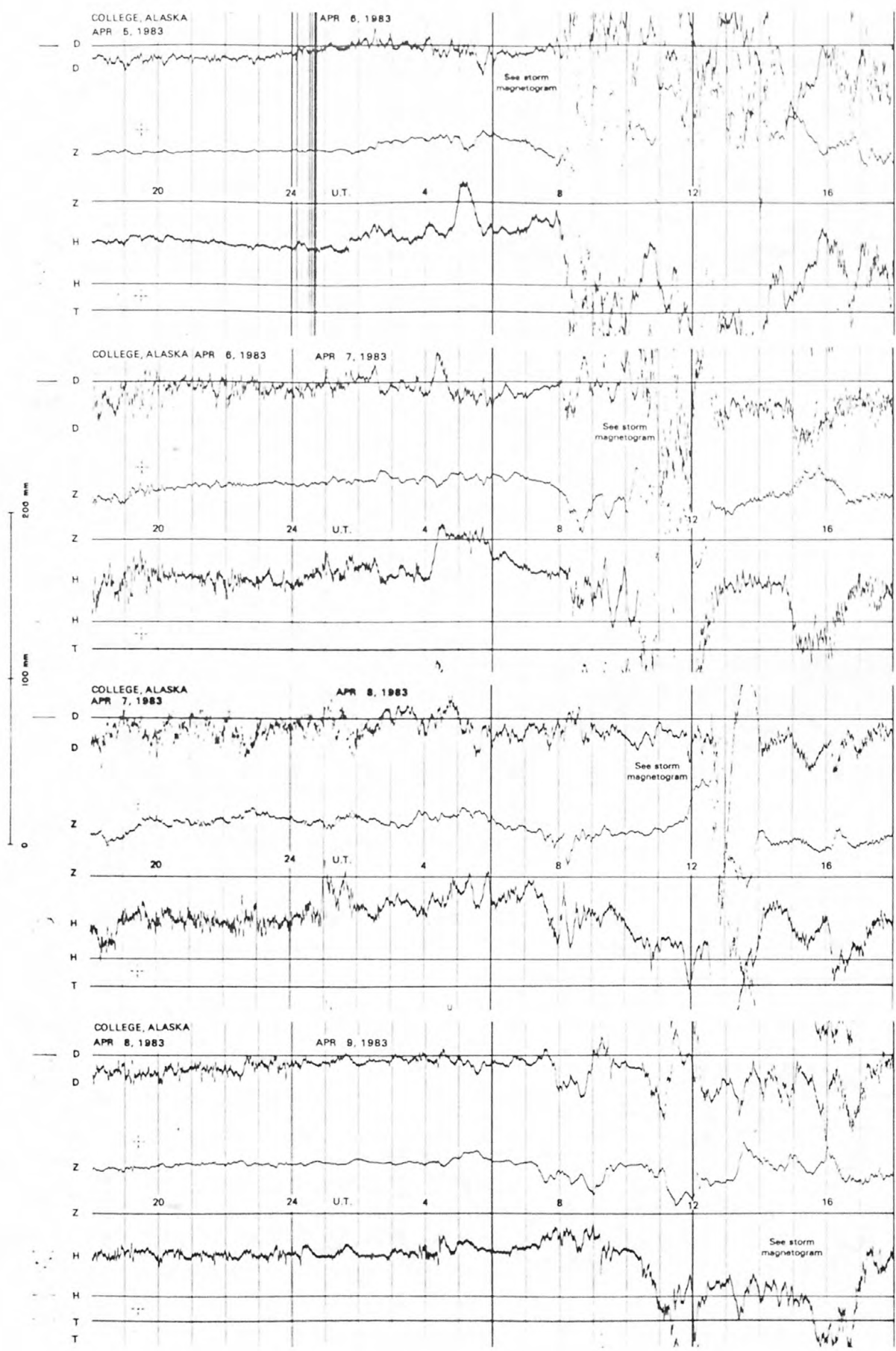


SEE PRELIMINARY CALIBRATION DATA FOR SCALE VALUES & BASELINE VALUES

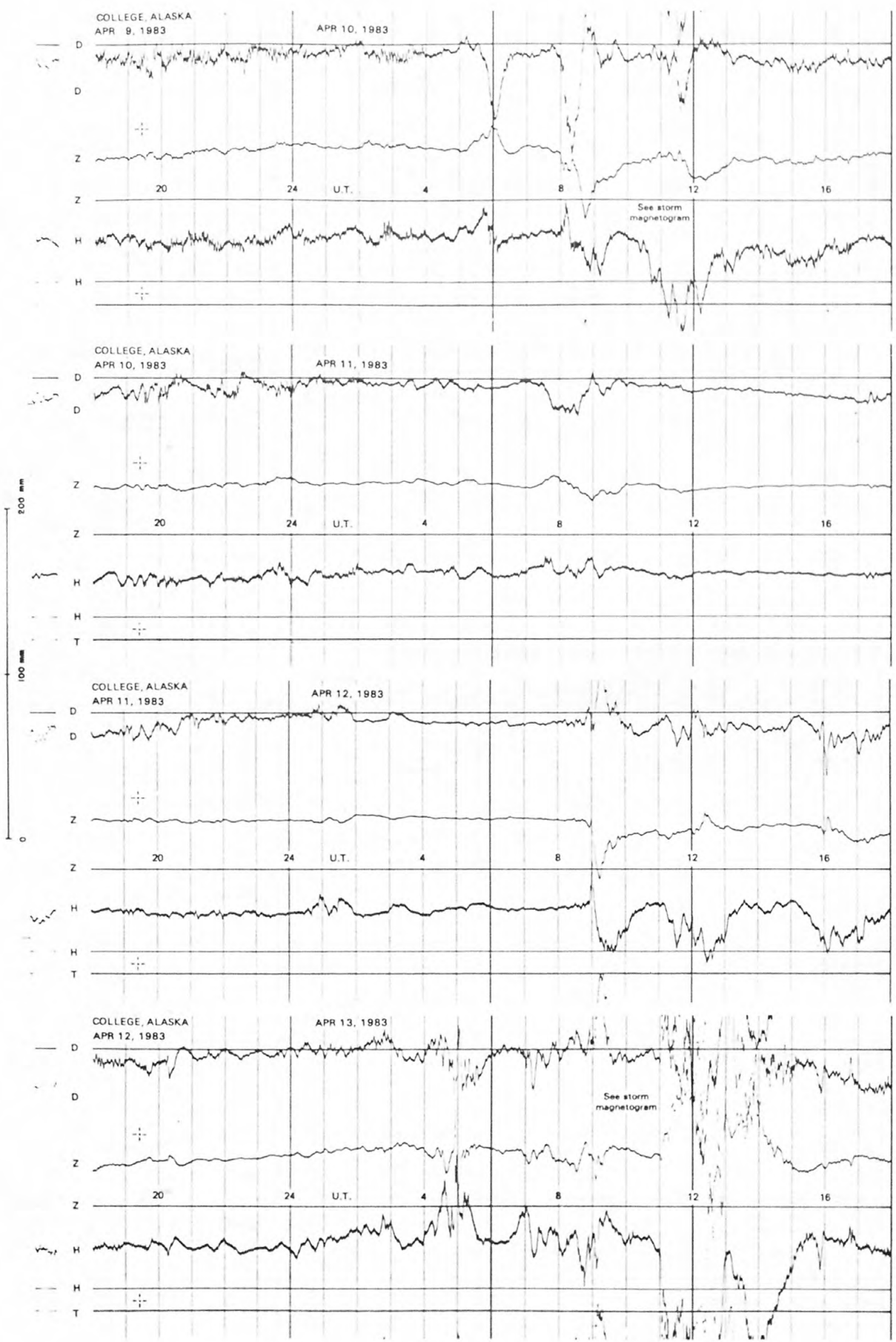
NORMAL MAGNETOGRAMS



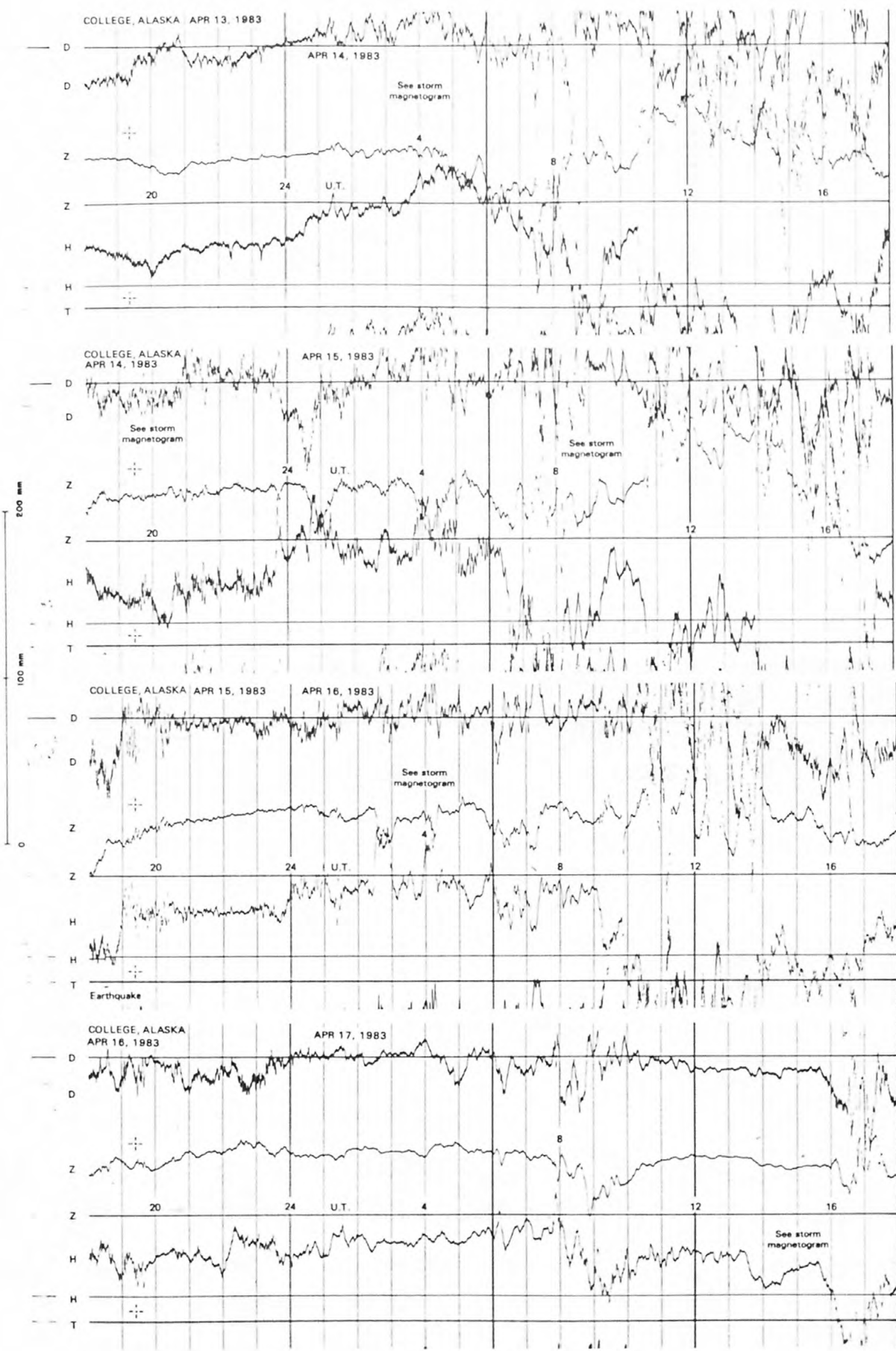
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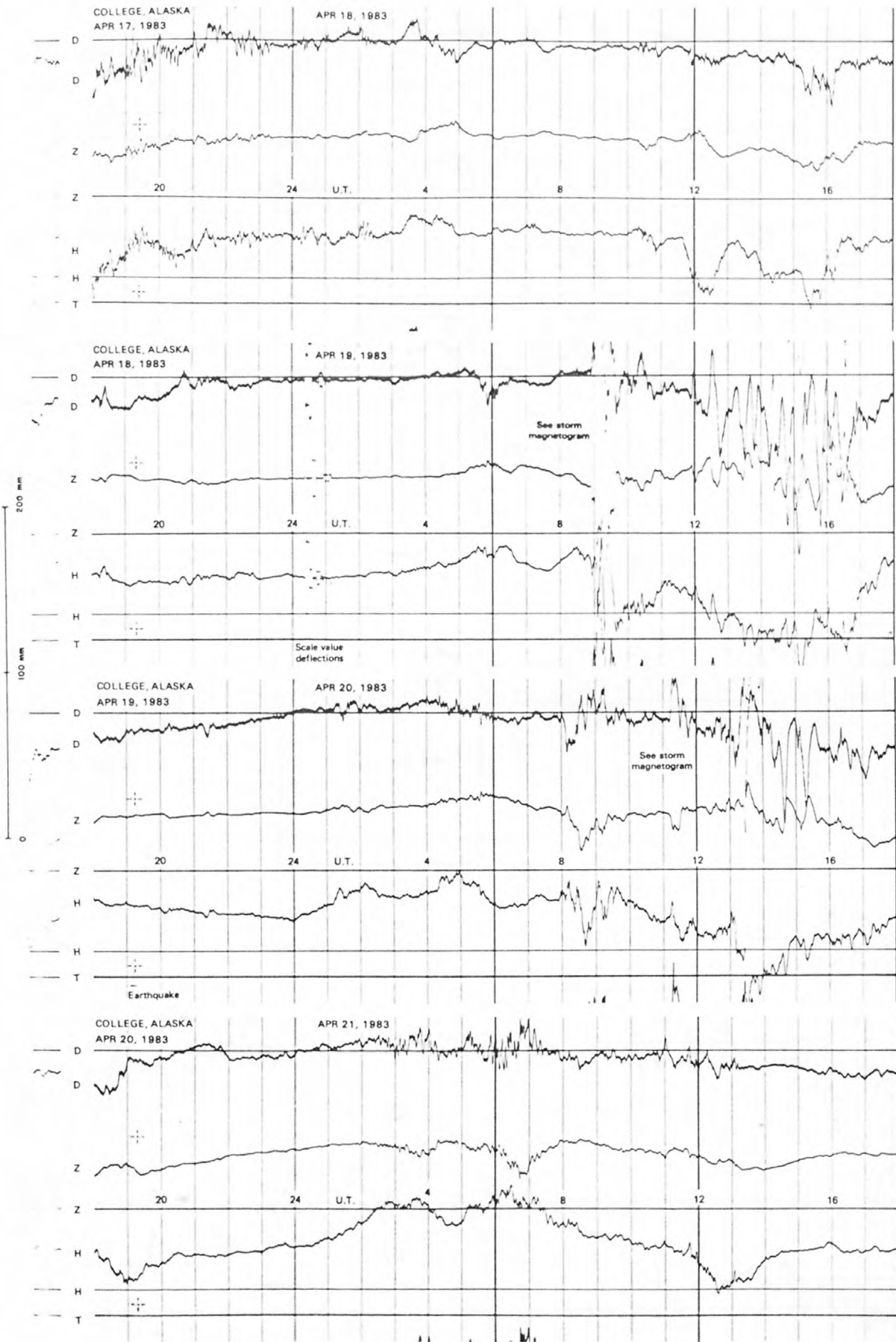
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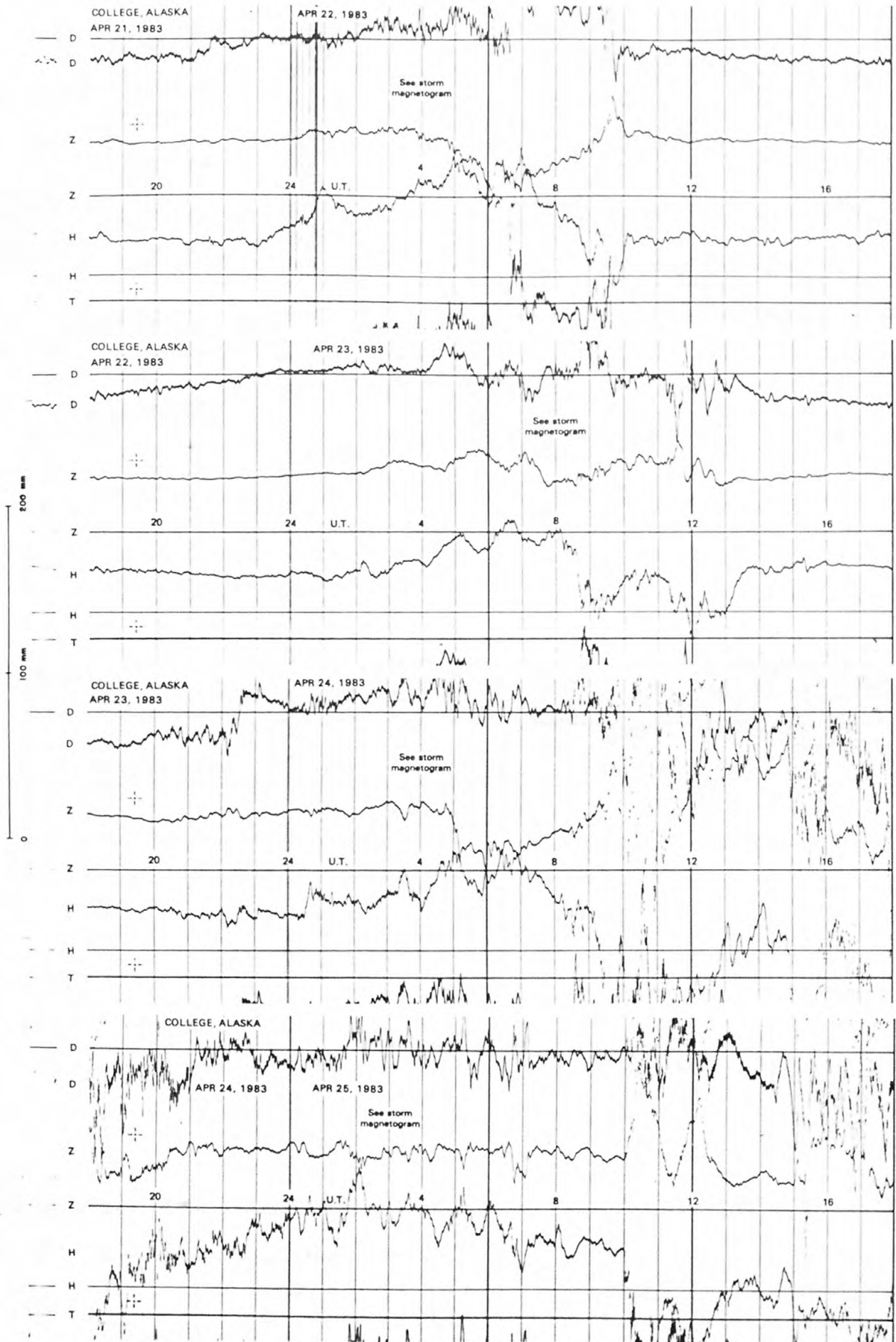
NORMAL MAGNETOGRAMS



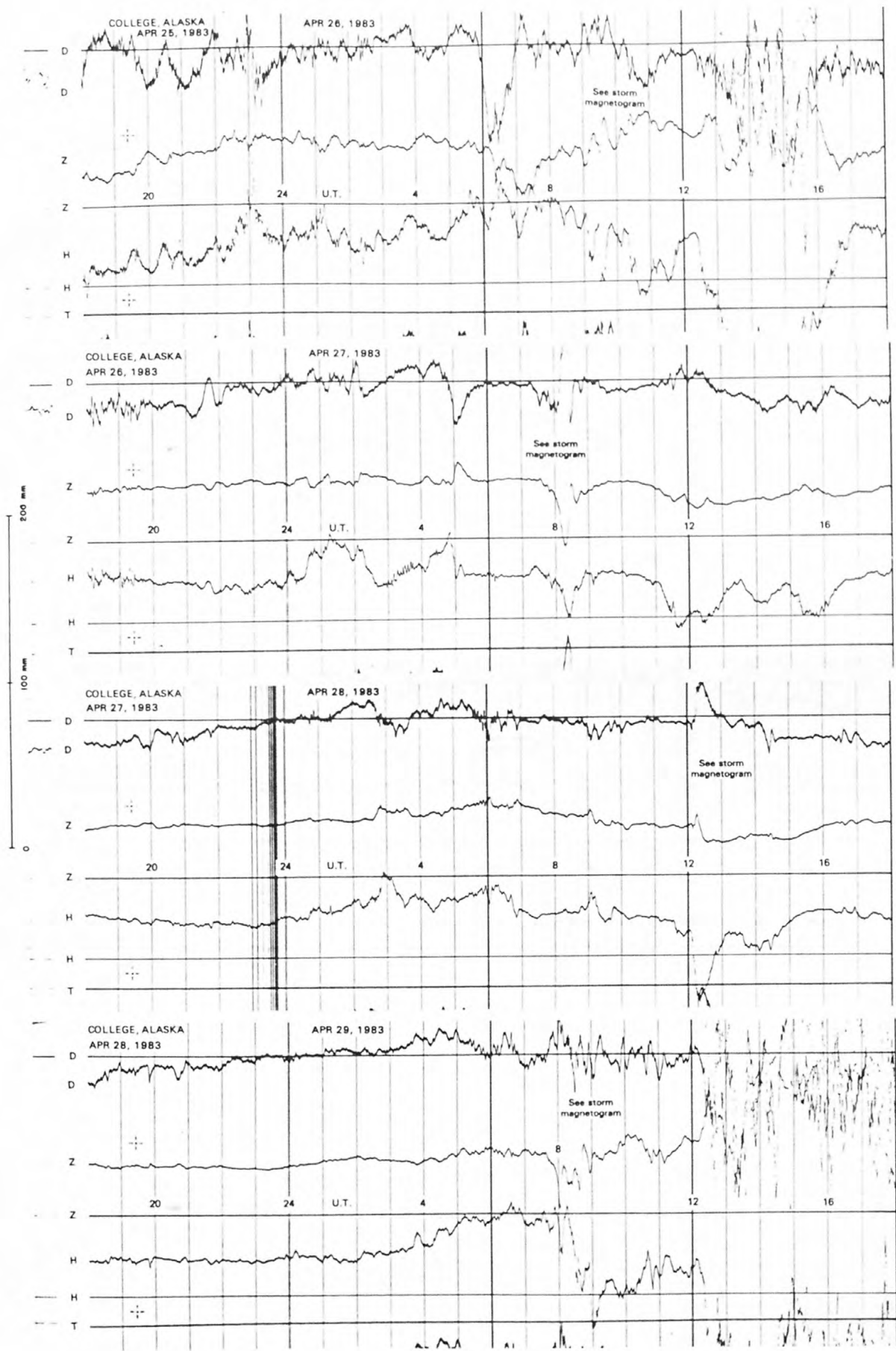
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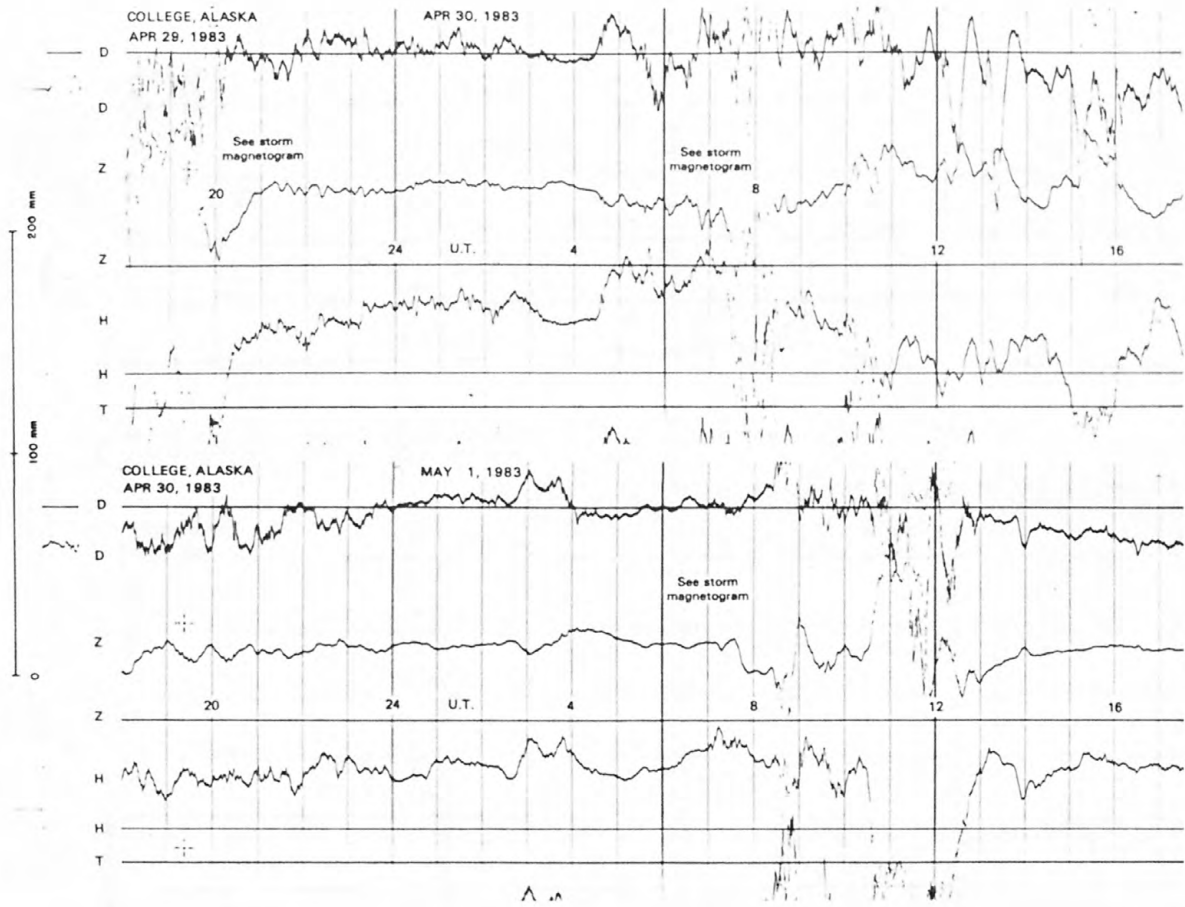
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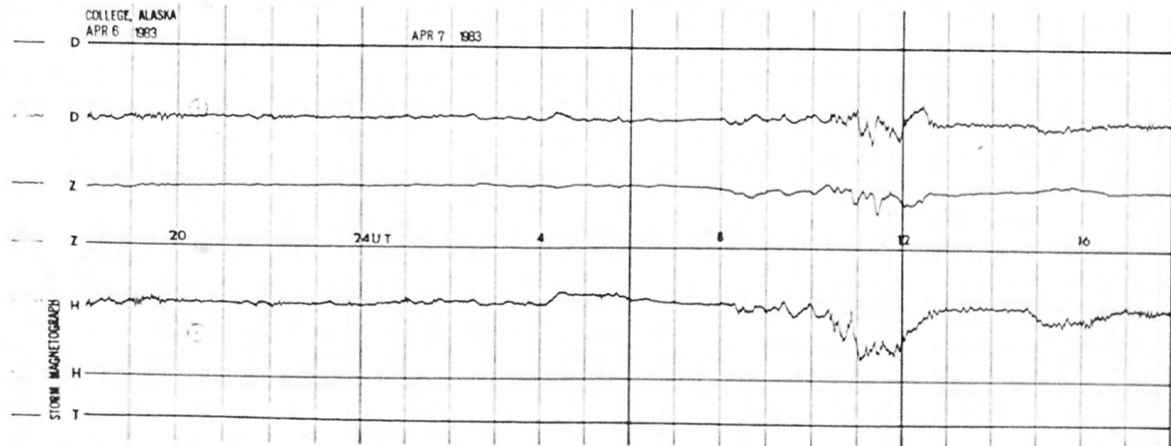
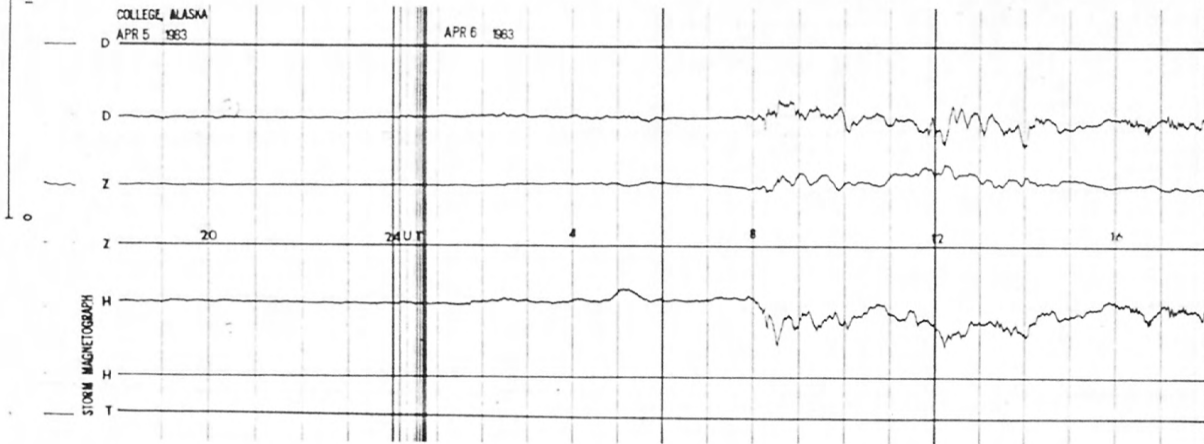
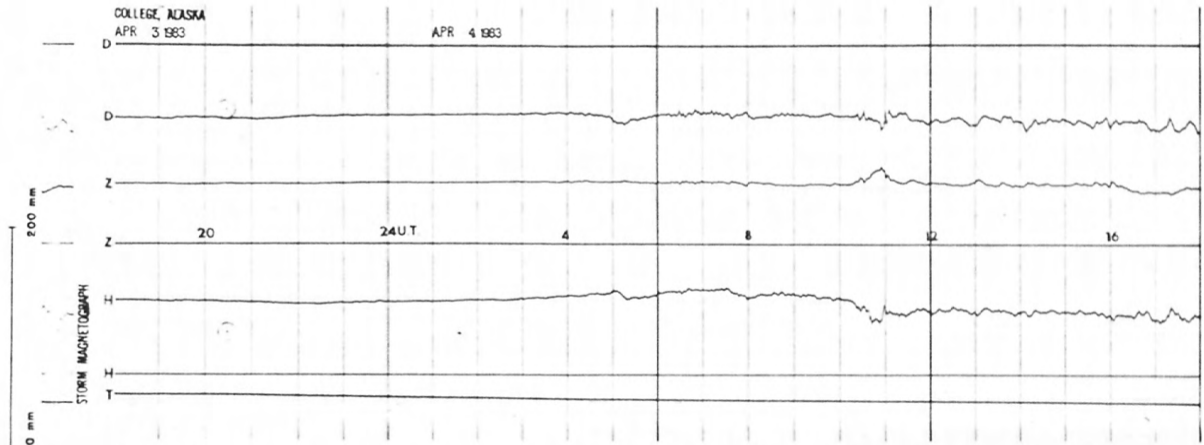
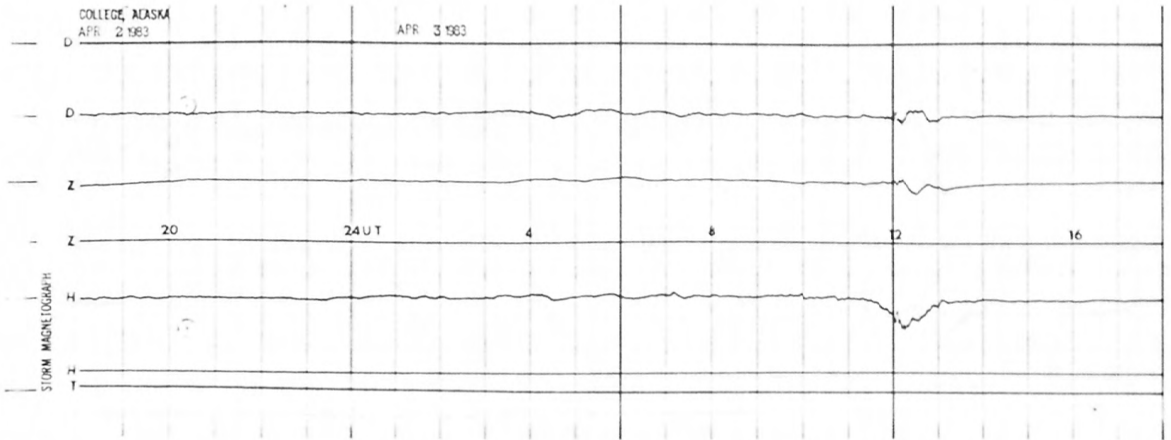
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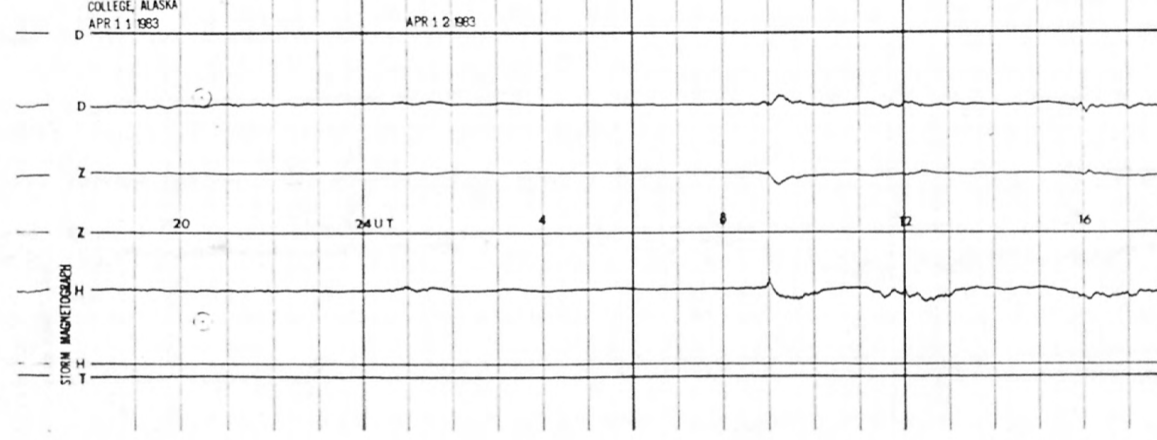
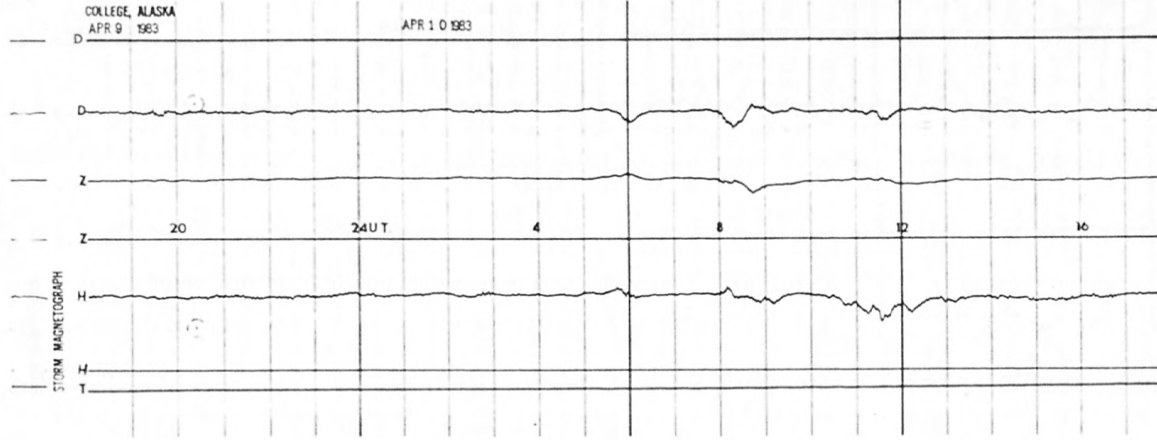
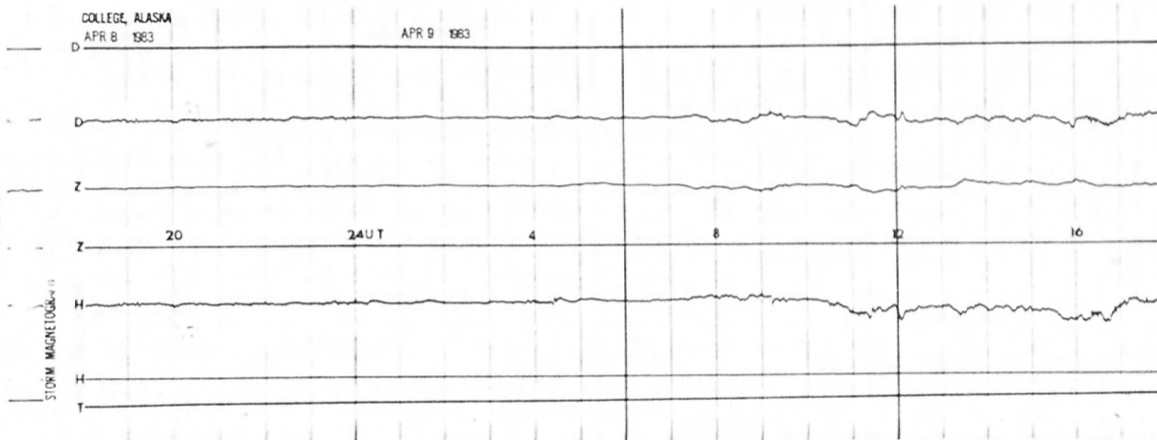
NORMAL MAGNETOGRAMS



STORM MAGNETOGRAMS

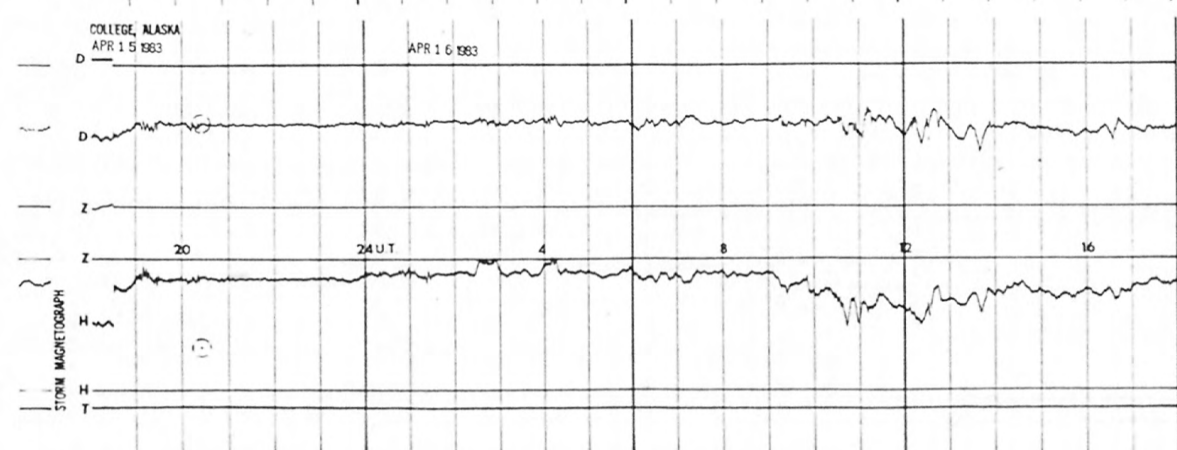
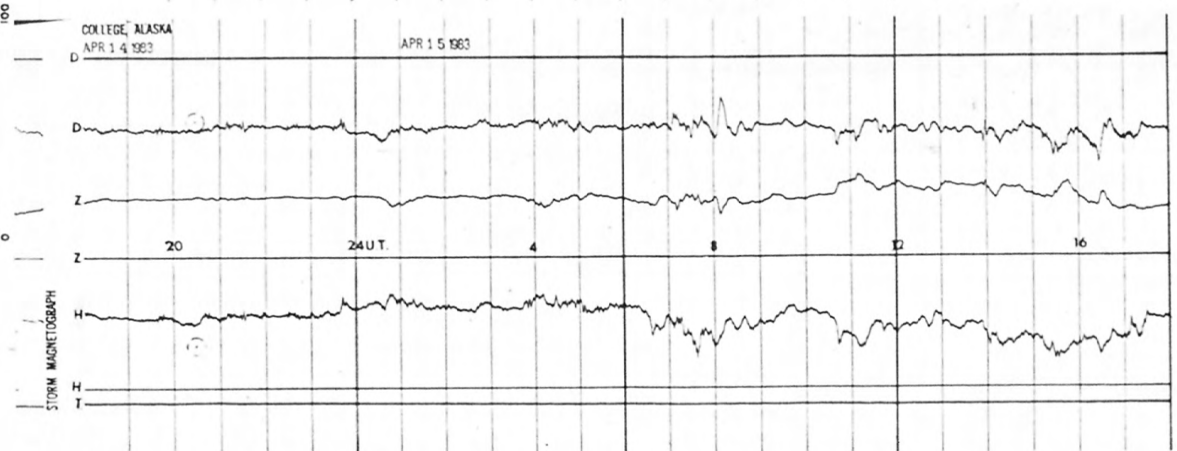
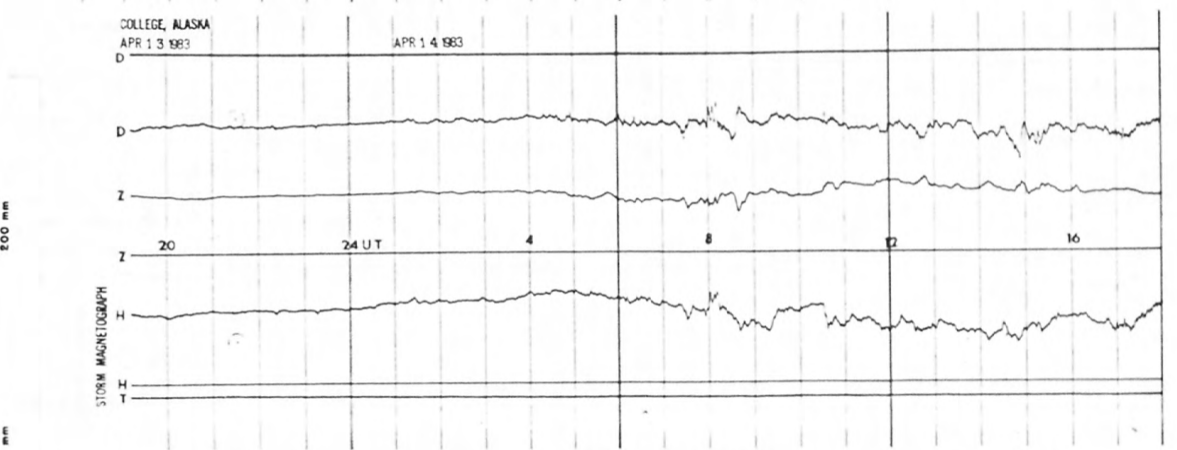
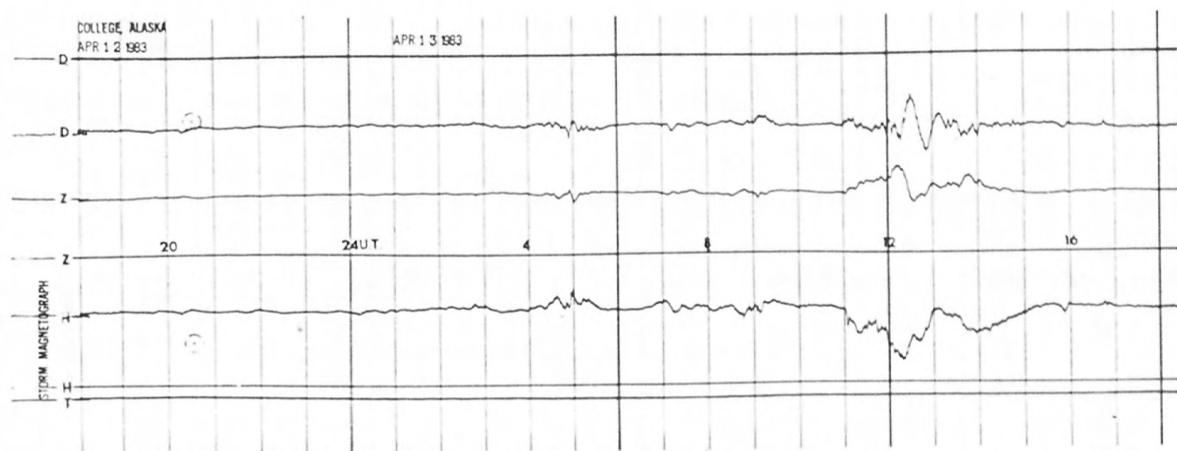


STORM MAGNETOGRAMS

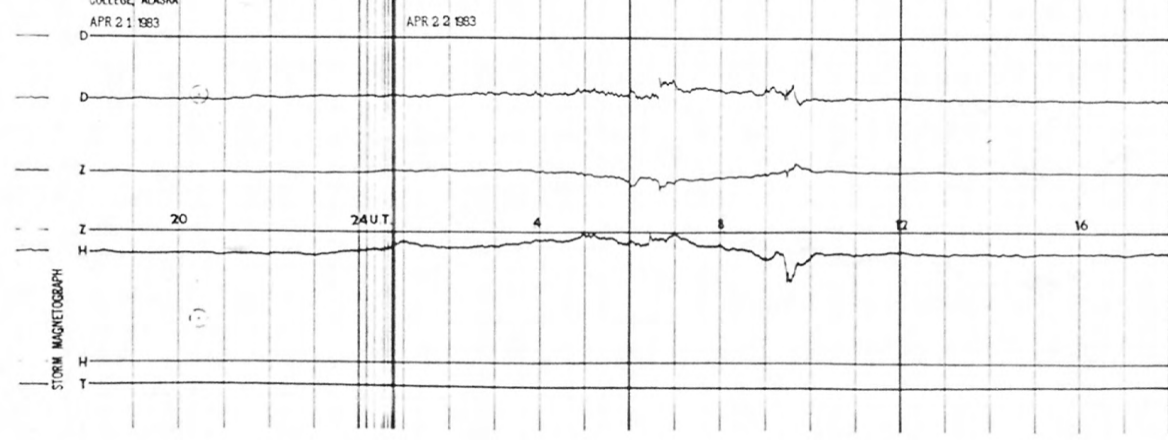
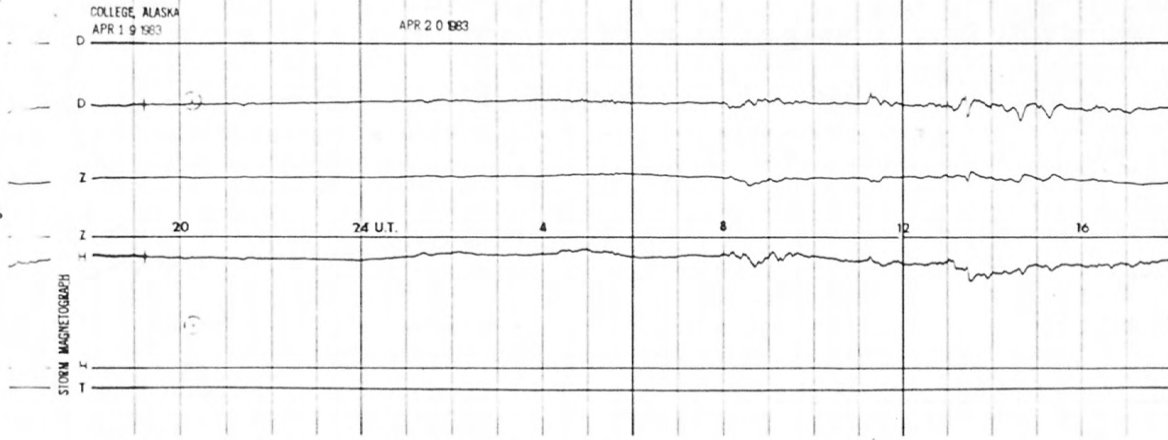
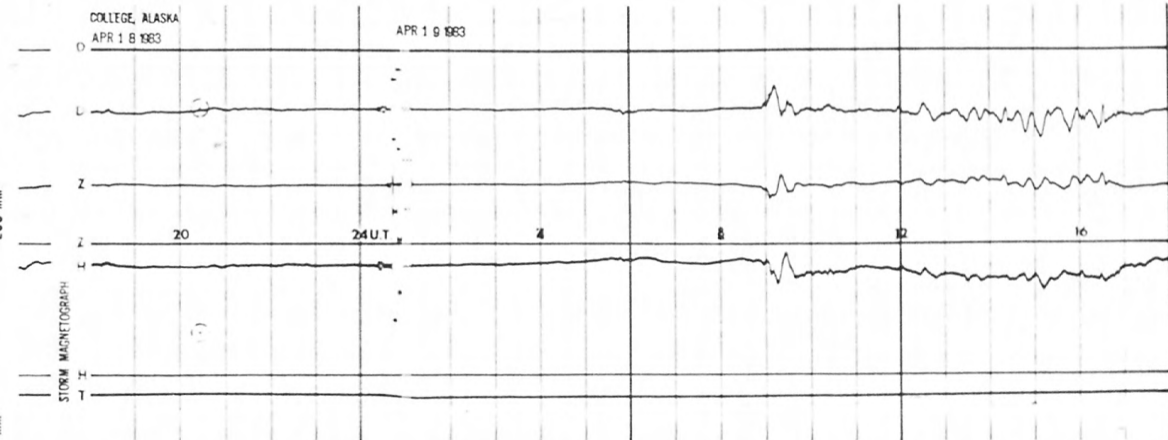
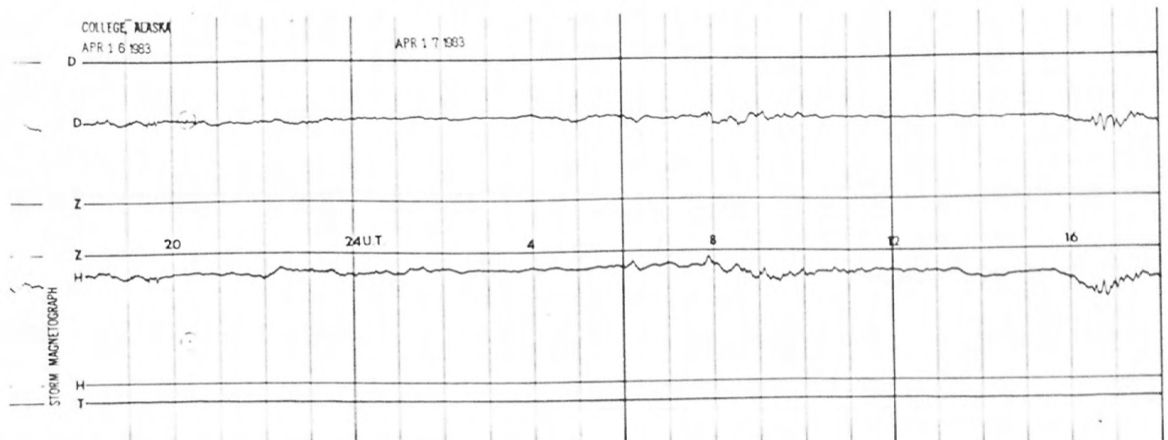


200 mm
100 mm
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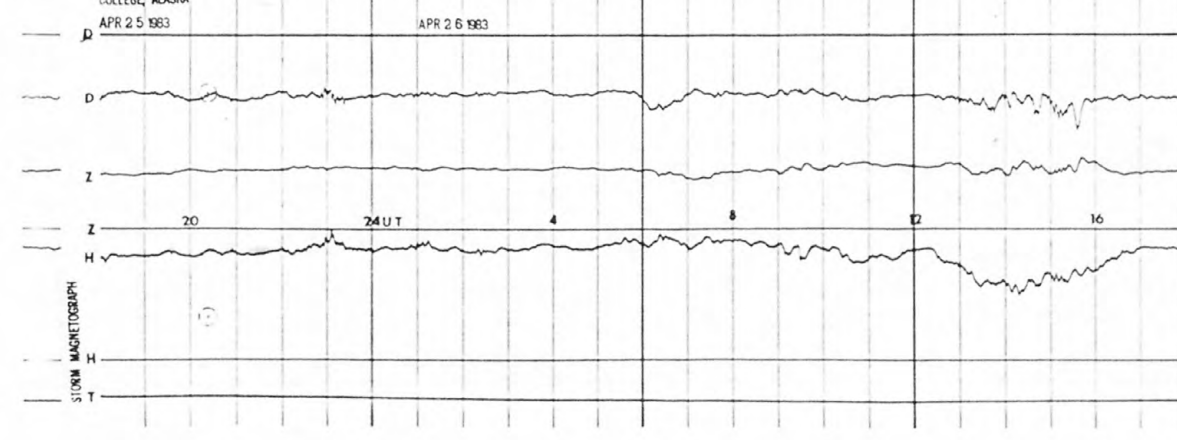
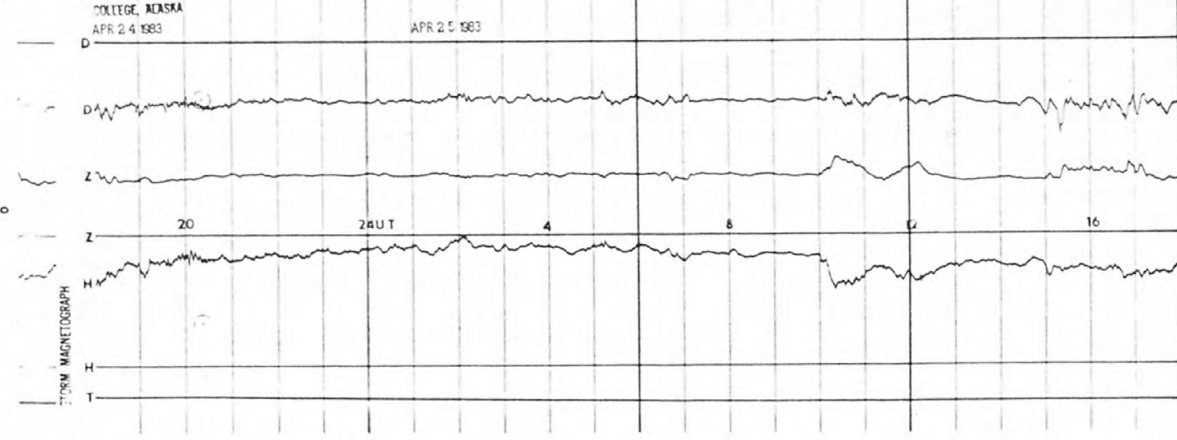
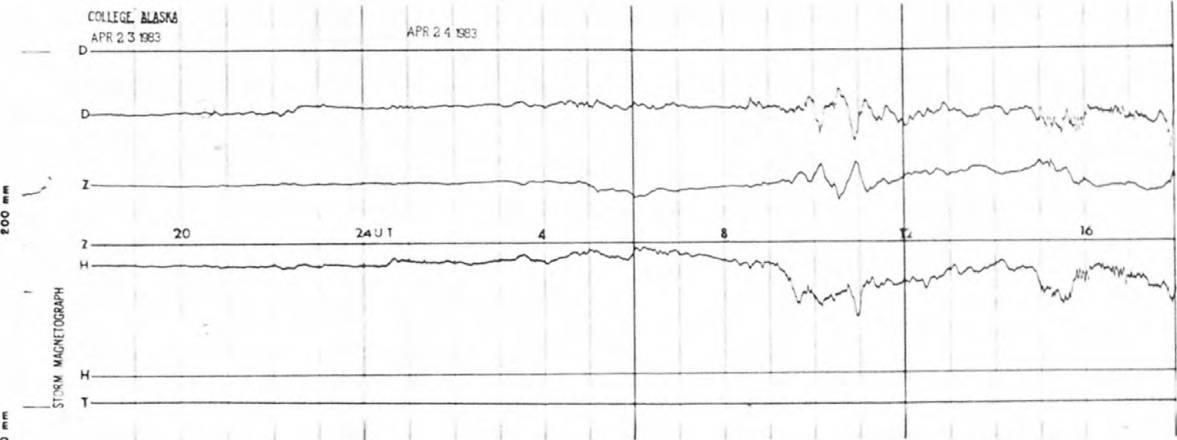
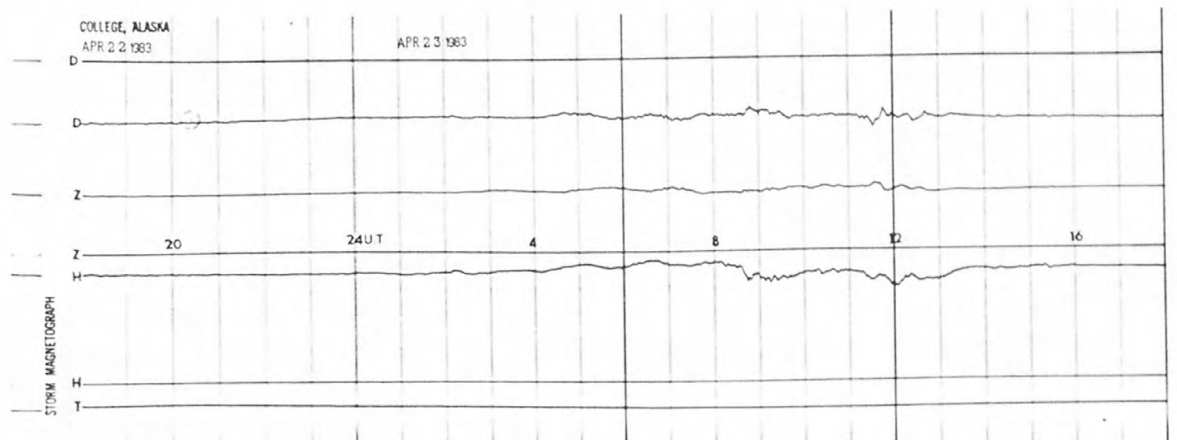
STORM MAGNETOGRAMS



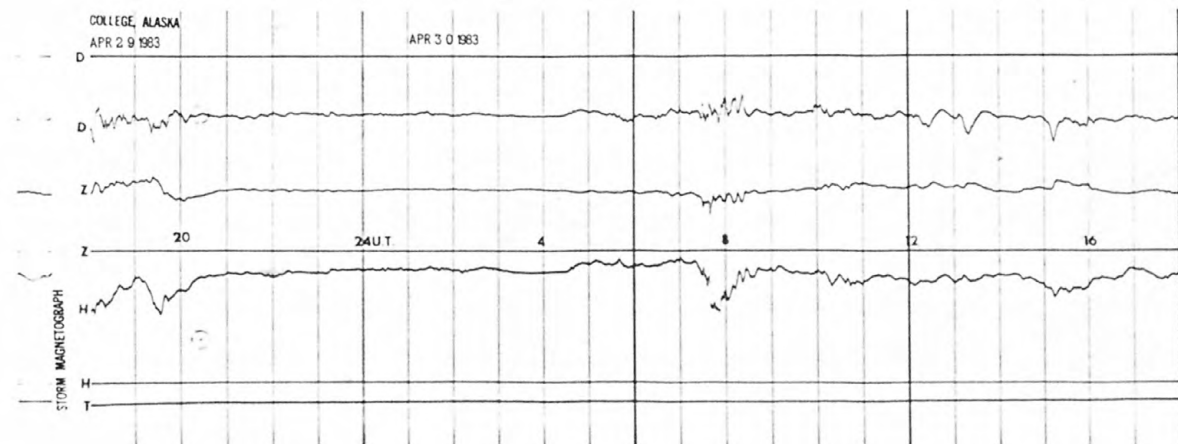
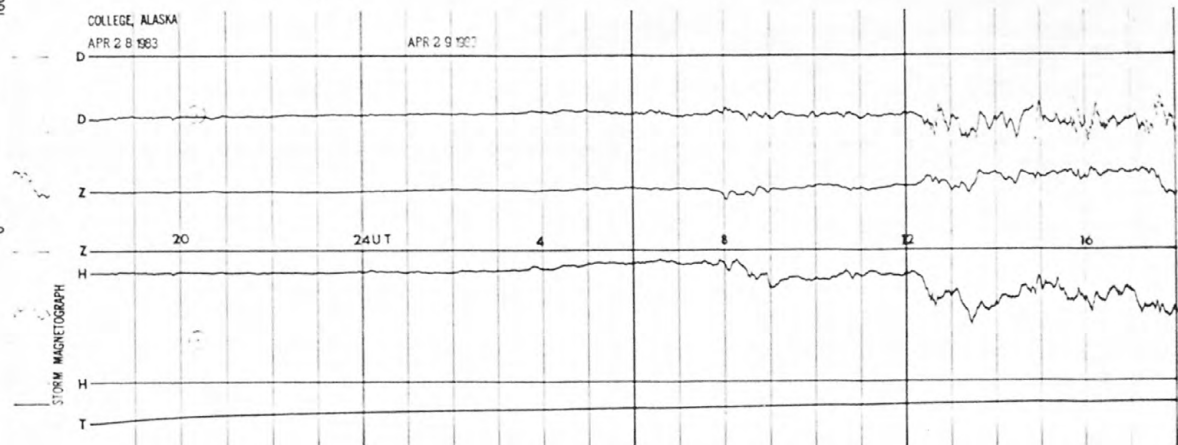
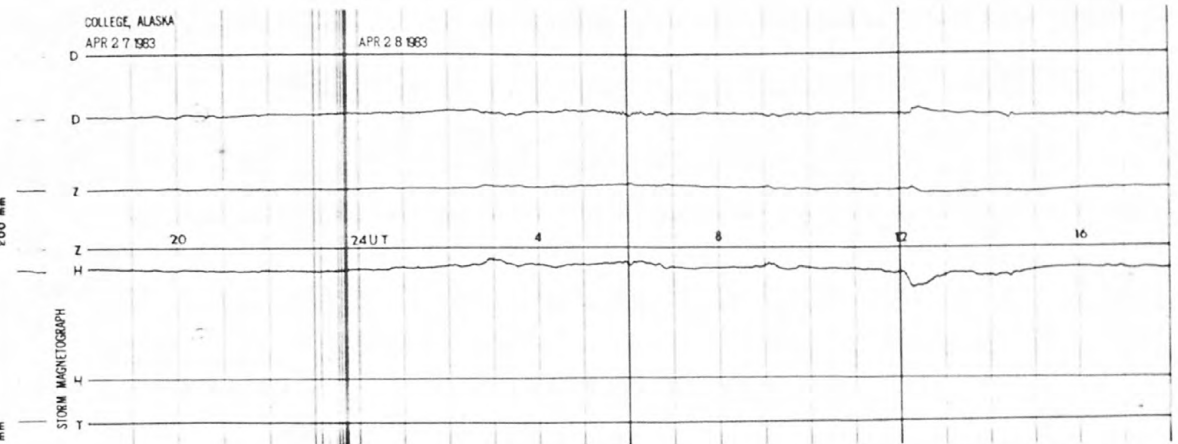
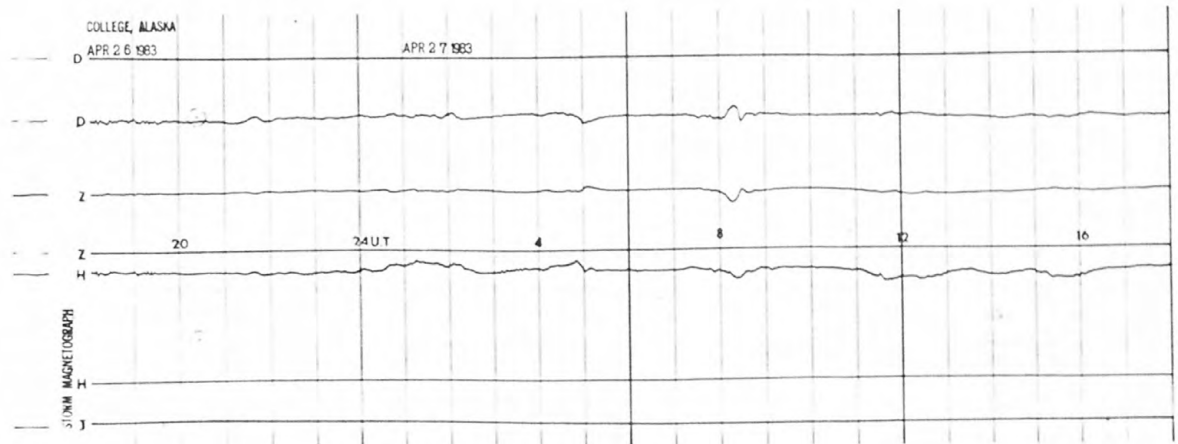
STORM MAGNETOGRAMS



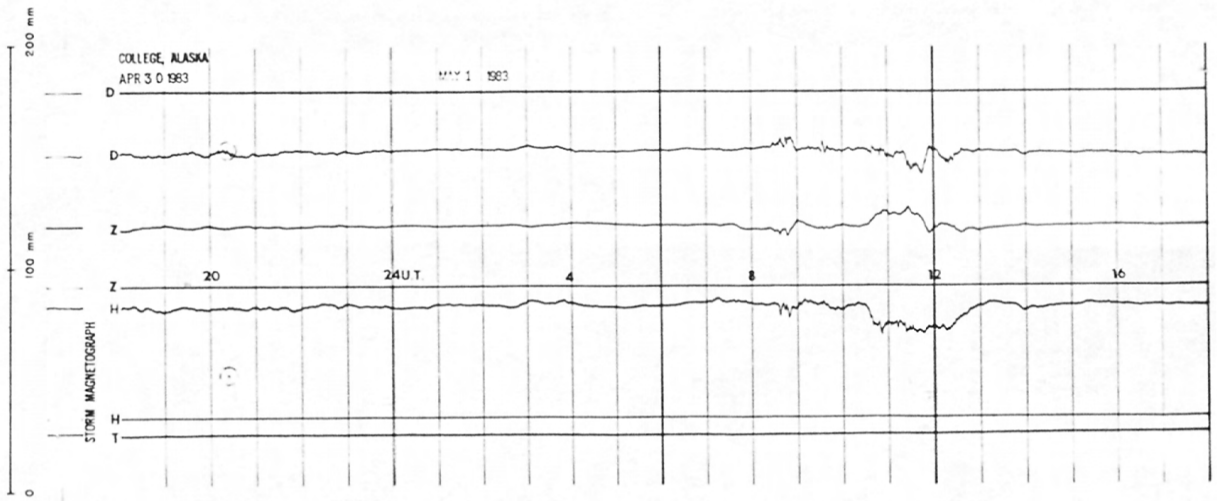
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