#197

ISIS 1

ELECTRON DENSITY AND TEMP

69-009A-07A

ISIS-1

ELECTRON DENSITY & TEMPERATURE

69-009A-07A

This data set has been restored. The original tape was 1600 BPI, EBCDIC (the first file), and ASCII (the second file) , 9-track. The DR and DS tape is 9-track, BINARY and is multi-filed. The DR tape is a 3480 cartridge and the DS tape is 6250 BPI.

The DR, DS, and DD number along with the time spans are given as follows:

DR#	DS#	DD#	FILES	TIME SPAN
DR02909	DS02909	D-13684	1	01/30/69 - 05/31/71
			2	01/30/69 - 05/31/71

REQ. AGENT	RD NO.	ACQ. AGENT
LSM	RB2918	LLD

ISIS-4

ELECTRON DENSITY & TEMPERATURE

69-009A-07A

This data set consists of one Electron Density and Temp. tape. The tape was created on the Ibm 360 computer and is 1600 BPI, Ebcdic (the first file), and ASCII (the second file). Both files are identical. The time span is as follows:

D#	C#	files	Time Span
D-13684	C-11424	2	01/30/69-5/31/71

D 14885

UNITED STATES GOVERNMENT

Memorandum

: Lee Dubach, NSSDC

DATE: December 21, 1972

FROM L. H. Brace, ISIS-I Probe Investigator

SUBJECT Qualification of ISIS-I electrostatic probe measurements

The ISIS-I probe measurements of electron temperature (T_e) and concentration (N_e) that we have submitted to the data center require a certain amount of qualification with regard to their accuracy. In this letter, which can be copied for the use of prospective data users, I will attempt to outline what we know about the accuracy of these measurements.

The goal of the computer analysis program was to evolve an automatic system that reflected an appropriate balance between measurement accuracy on one hand and economy of computer time on the other. The latter is necessary to permit a large fraction of the data to be analyzed given the limited amounts of computer time available for this analysis.

In the process of developing the program we found that the data base had a whole spectrum of data quality. Much of it consisted of nearly ideal volt-ampere curves that could be handled by a relatively simple program. However some of the raw data suffers from such problems as sounder-induced interference, ionospheric fine structure, photoemission from the spacecraft and in cases of very low electron density, positive spacecraft potentials. Since it is often necessary in correlative studies to provide measurements with whatever accuracy is possible, we have had to stretch our criteria for eligible curves rather extensively. As a result, it is sometimes possible for the analysis program to fail to get a value for T_e or N_e, or to get values that are in error. However we have reached a compromise program that can analyze a very large fraction of the data it encounters (> 90%) and will usually provide accuracies within 10% of the value that could be obtained with a more careful hand analysis.

The absolute values for T_e may be high by up to 10% because of experimental factors not easily corrected for and because of a tendency of the exponential fitting routine to fit too far up the curve, especially at temperatures below 2000°k. At higher T_e, more samples are available in the exponential region, and the accuracy improves.

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The N_e values have been correlated with sounder-derived values, using the local plasma frequency, and are found to be systematically high by about 20-30%. This factor varies with satellite attitude and the value of N_e in a manner that has not been fully evaluated. If greater absolute accuracy is needed, I would suggest using the sounder-derived value.

In summary, then, it is important for users to note that all of the measurements are not equally good quality. If the user requires the greatest possible accuracy from a given set of data, it will be necessary to request us to scan the original data set to evalute the accuracy or, alternatively, to reanalyze the data with a program that is more specific to that particular set of data. We will be happy to do that for limited amounts of data.

LH Brace

Larry H. Brace

69-009A-07A

FORMAT

CHARACTER	DESCRIPTION
1- 3	Day Count
4- 8	Orbit Number
9-11	Geodetic Latitude
12-15	Geodetic Longitude
16-19	Altitude
20-25	Date YR/MO/DA
26-31	Hour HR/MN/SA
32-35	Electron Temperature
36-42	Electron Density
43-44	B
45-49	L
50-52	Dip Latitude
53-55	Zenith Angle
56-58	A(P)
59-61	Solar Flux
62-64	Geomagnetic Latitude
65-68	Geomagnetic Longitude
69-71	Local Time
72-74	DIP
75-78	Satellite Potential
79	Special Function
80	Satellite Code

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ISIS-1

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***** JOB DONE.
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