

**R O S E T T A**  
**FLIGHT REPORTS**  
**of RPC-MAG**

**RO-IGEP-TR-0010**

**Issue: 3    Revision: 2**

**April 12,2007**

**Report of the**  
**COMMISSIONING PART 3**  
**Time period: September 06. - 10., 2004**

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<h1 style="margin: 0;">ROSETTA</h1>	Document: RO-IGEP-TR-0010 Issue: 3 Revision: 2 Date: April 12, 2007 Page: I
<b>IGEP</b> Institut für Geophysik u. extraterr. Physik Technische Universität Braunschweig	

## Contents

<b>1</b>	<b>Summary</b>	<b>1</b>
<b>2</b>	<b>September 06, 2004:</b>	<b>1</b>
2.1	Actions . . . . .	1
2.2	Plots of Calibrated Data using the new Temperature Model . . . . .	2
2.3	Plots of ROSETTA's Reaction Wheels Speeds . . . . .	9
<b>3</b>	<b>September 07, 2004:</b>	<b>13</b>
3.1	Actions . . . . .	13
3.2	Plots of Calibrated Data using the new Temperature Model . . . . .	13
3.3	Plots of ROSETTA's Reaction Wheels Speeds . . . . .	29
<b>4</b>	<b>September 08, 2004:</b>	<b>35</b>
4.1	Actions . . . . .	35
4.2	Plots of Calibrated Data using the new Temperature Model . . . . .	35
4.3	Plots of ROSETTA's Reaction Wheels Speeds . . . . .	52
4.4	Plots of ROMAP . . . . .	59
<b>5</b>	<b>September 09, 2004:</b>	<b>63</b>
5.1	Actions . . . . .	63
5.2	Plots of Calibrated Data using the new Temperature Model . . . . .	63
5.3	Plots of ROSETTA's Reaction Wheels Speeds . . . . .	82
5.4	Plots of ROMAP . . . . .	89
<b>6</b>	<b>September 10, 2004:</b>	<b>93</b>
6.1	Actions . . . . .	93
6.2	Plots of Calibrated Data using the new Temperature Model . . . . .	93
6.3	Plots of ROSETTA's Reaction Wheels Speeds . . . . .	104

R O S E T T A		Document: RO-IGEP-TR-0010
		Issue: 3
		Revision: 2
IGEP	Institut für Geophysik u. extraterr. Physik	Date: April 12,2007
	Technische Universität Braunschweig	Page: 1

## 1 Summary

The third commissioning phase for RPC-MAG was executed in the time period September 06. – 10., 2004. All the performed steps were successful. MAG worked as expected.

The next sections give a brief description of the executed activities and show the obtained data. Housekeeping data ( Temperature of the OB & IB sensor, Filter Stages A & B, Filter configuration register, Reference voltage, negative and positive 5V supply voltage, and the coarse HK sampled magnetic field data of the OB sensor ) are presented as well as magnetic field science data of the OB and IB sensor in the activated modes. Magnetic field data are plotted in instrument coordinates if not otherwise stated. They are calibrated according to the results of the ground calibration and the results of the new created temperature model using the flight data from March until September. Sensitivity, Misalignment, and Temperature effects are taken into account. The s/c residual field is not subtracted.

The dynamic spectra show some clear lines which are varying with the time. A detailed investigation showed, that these lines have their origin in the reaction wheels of the ROSETTA S/C. As they are rotating with different speeds they generate different disturbance frequencies. The signatures of the reaction wheels are folded down in the measurement range of the magnetometers. A detailed investigation of this phenomenon is given in RO-IGEP-TR0012.

Additionally to the RPC-MAG instrument the LANDER Magnetometer was switch on from 2004-09-08T04:20 until 2004-09-09T24:00. Data and spectra will be shown.

## 2 September 06, 2004:

### 2.1 Actions

MAG was switched on immediately after PIU and set to HK mode at 19:17. All commands passed smoothly and the instrument followed in the expected way.

Time	Stage A, Stage B, Filter cfg	Stage 1, Stage 2, Stage3	Mode
20:02 – 20:18	1 2 0	1 2 0	SID2
22:19 – 24:00	0 0 0	0 0 0	SID3

R O S E T T A	Document: RO-IGEP-TR-0010
IGEP Institut für Geophysik u. extraterr. Physik Technische Universität Braunschweig	Issue: 3
	Revision: 2
	Date: April 12,2007
	Page: 2

## 2.2 Plots of Calibrated Data using the new Temperature Model

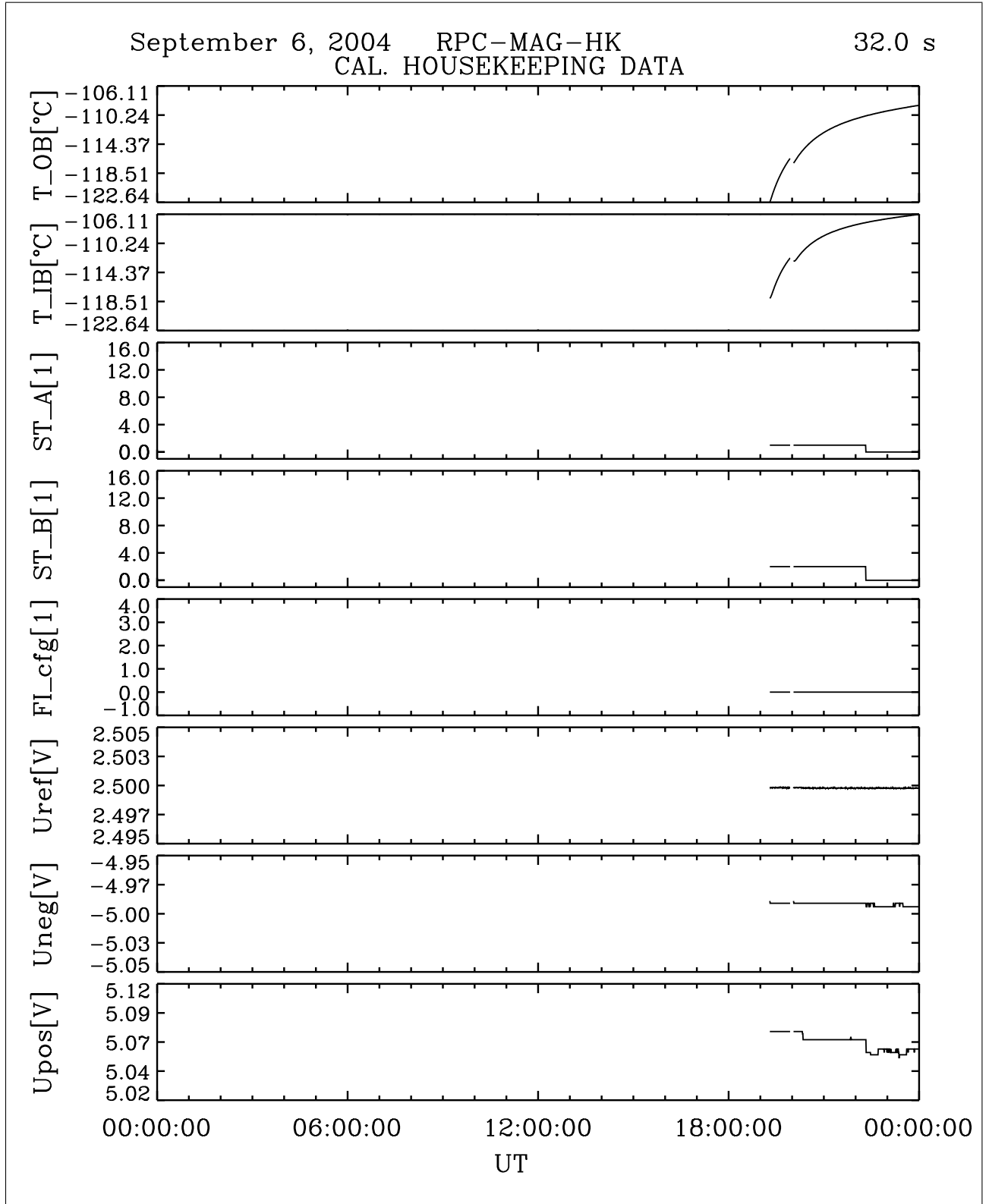


Figure 1: File: RPCMAG040906T1917\_CLA\_HK\_P0000\_2400

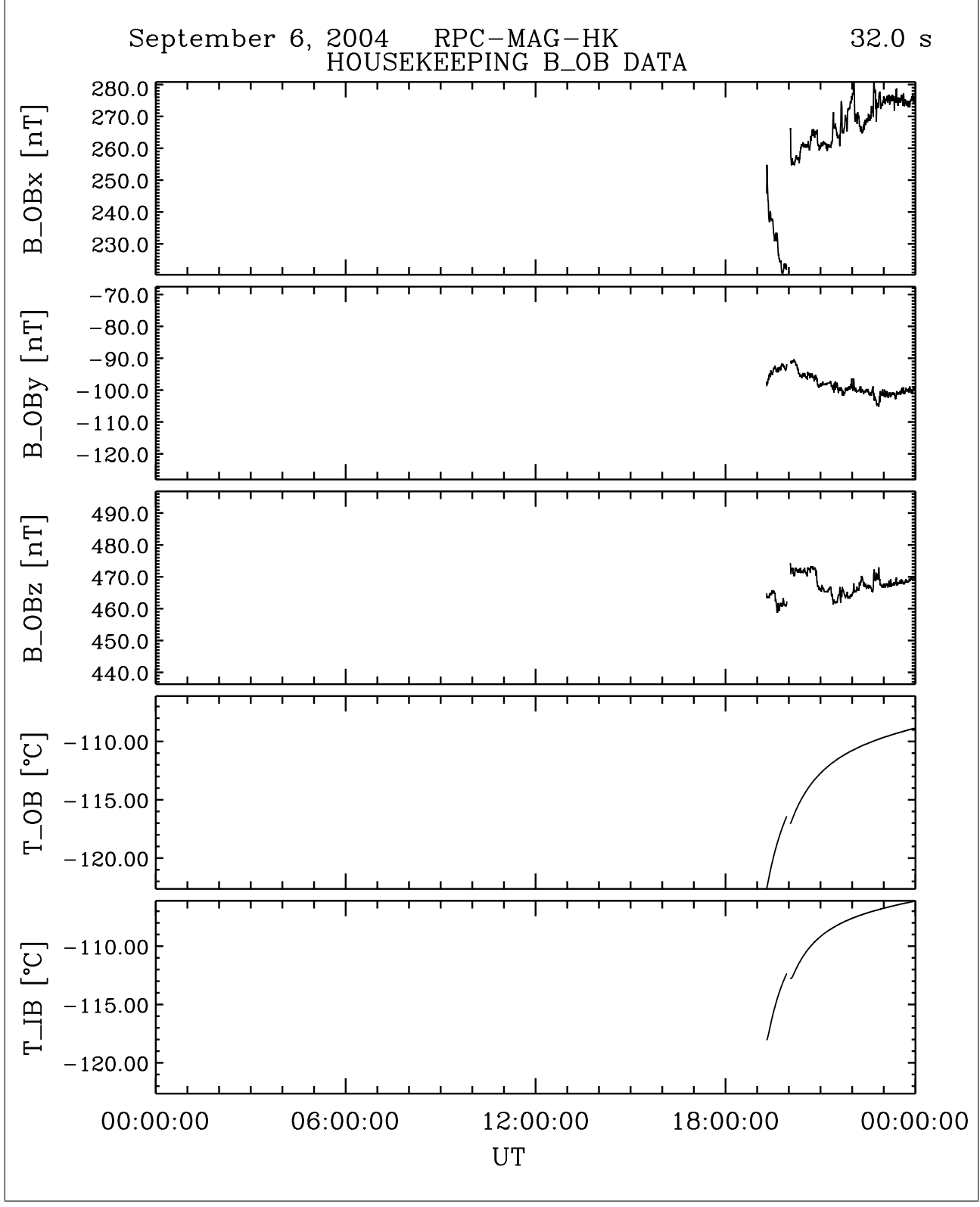


Figure 2: File: RPCMAG040906T1917\_CLA\_HK\_B\_P0000\_2400

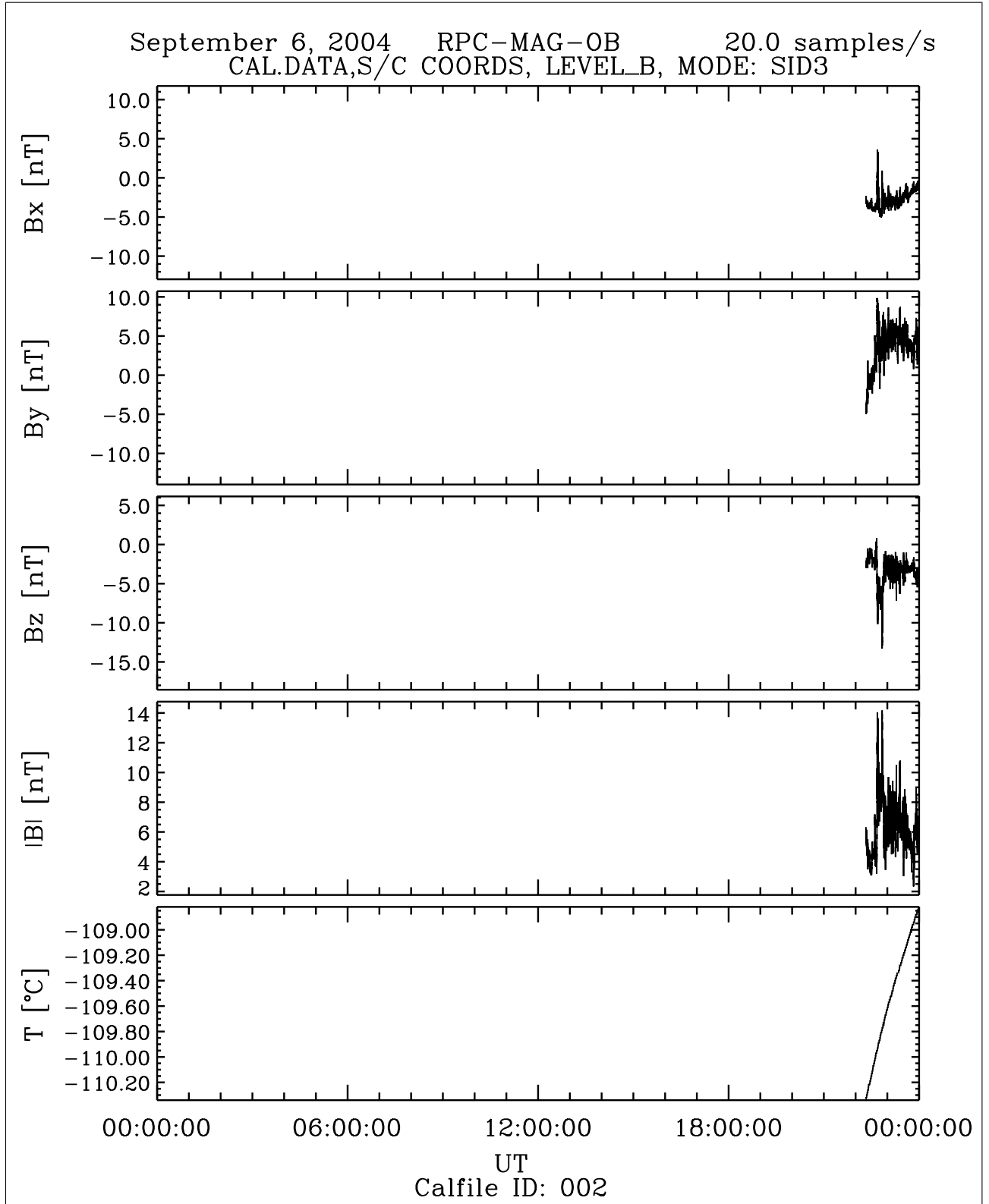


Figure 3: File: RPCMAG040906T2219\_CLB\_OB\_M3\_T0000\_2400\_002

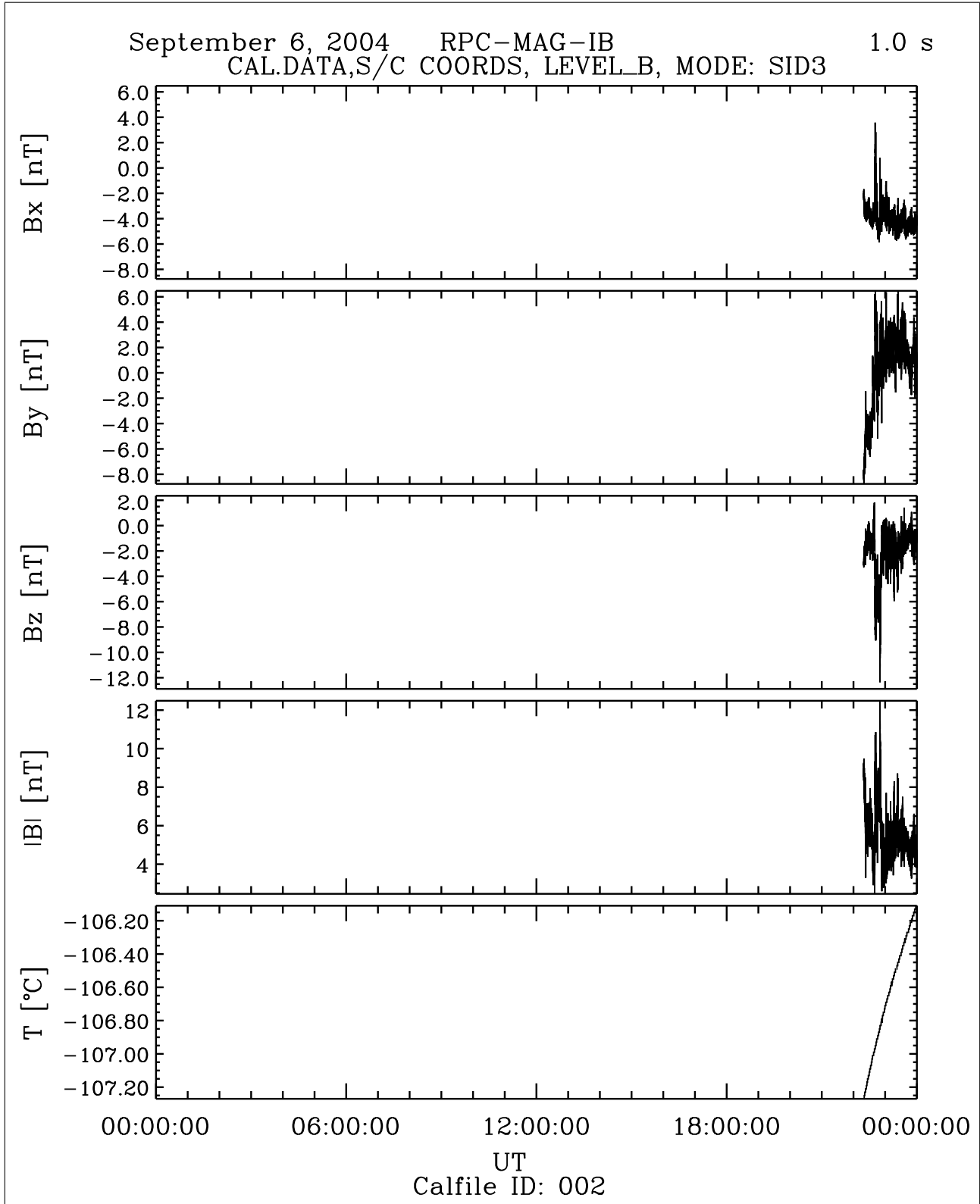


Figure 4: File: RPCMAG040906T2219\_CLB\_IB\_M3\_T0000\_2400\_002



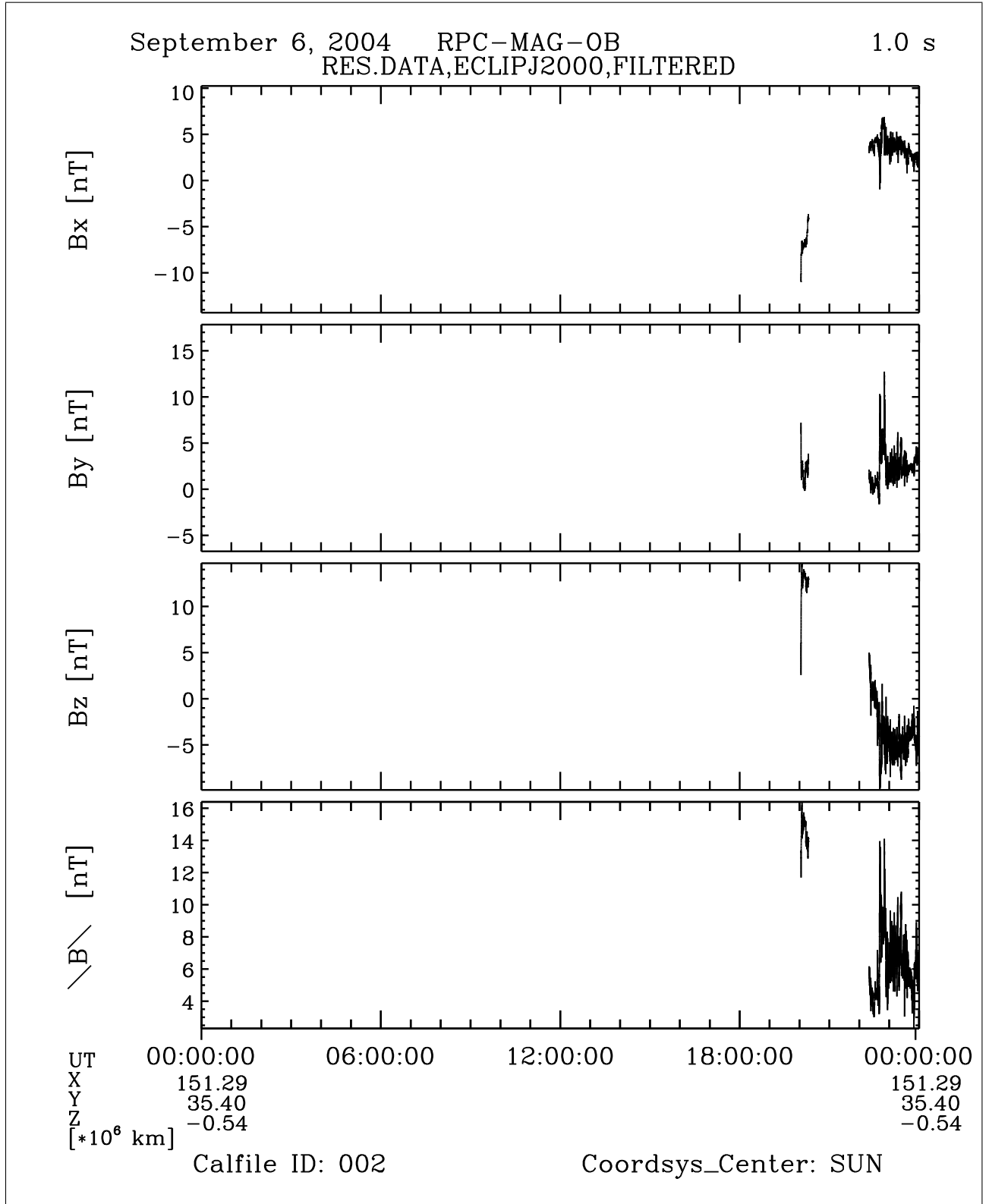


Figure 5: File: RPCMAG040906\_CLG\_OB\_A1\_T0000\_2400\_002

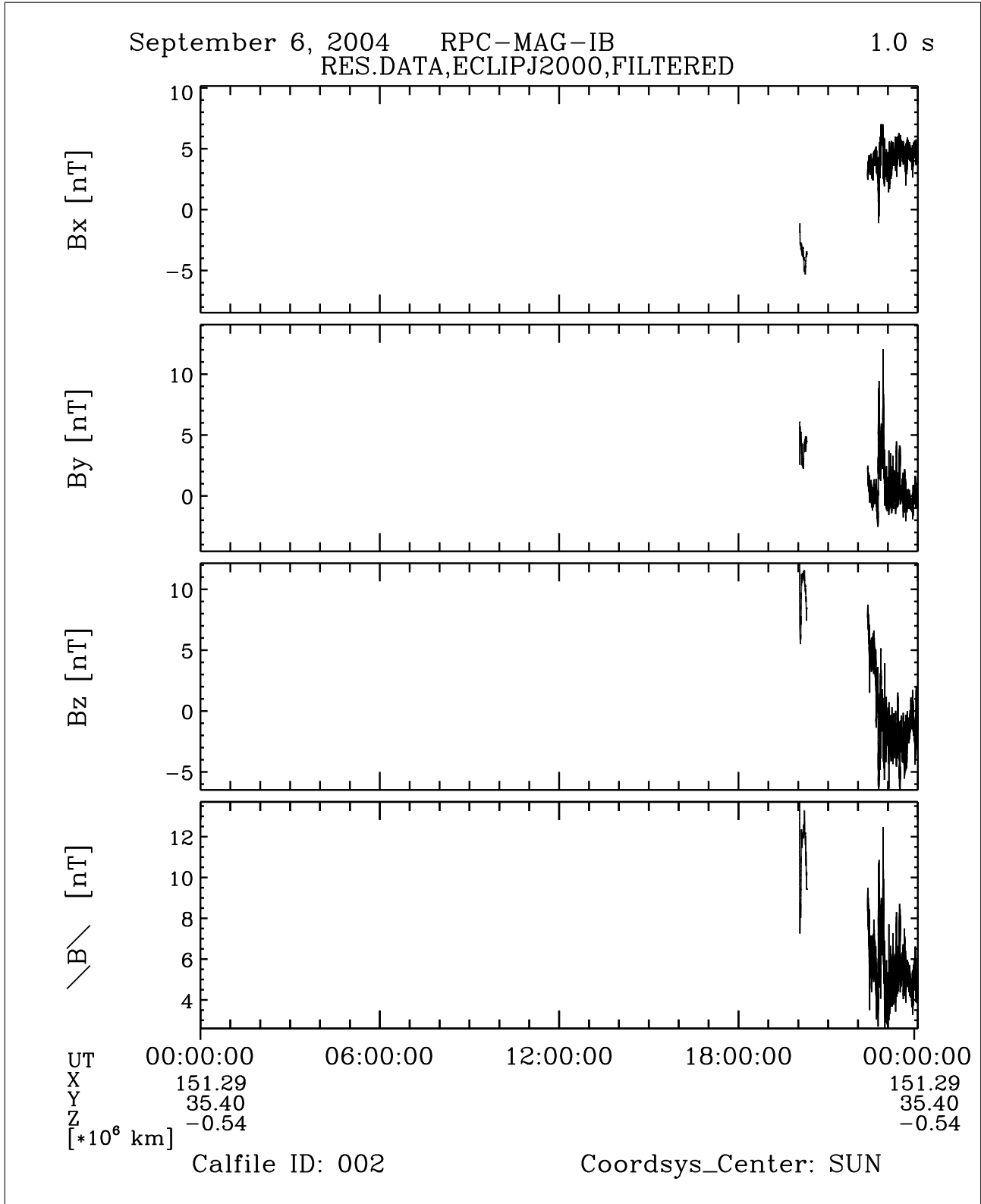


Figure 6: File: RPCMAG040906\_CLG\_IB\_A1\_T0000\_2400\_002

R O S E T T A		Document: RO-IGEP-TR-0010
		Issue: 3
		Revision: 2
IGEP	Institut für Geophysik u. extraterr. Physik	Date: April 12, 2007
	Technische Universität Braunschweig	Page: 9

### 2.3 Plots of ROSETTA's Reaction Wheels Speeds

The following plots show the time series of the revolutions of the 4 reaction wheels. Two kinds of data are shown:

- The original reaction wheel data as they are stored in the DDS.
- The theoretical response of the wheels impact seen by an instrument sampling with different frequencies. Here the response in the at 20 Hz and 1 Hz sampling frequency is plotted.

A comparison with the dynamic spectra of the MAG data gives an impressive accordance between the reaction wheel frequencies and the spectral lines observed in the dynamic MAG spectra.

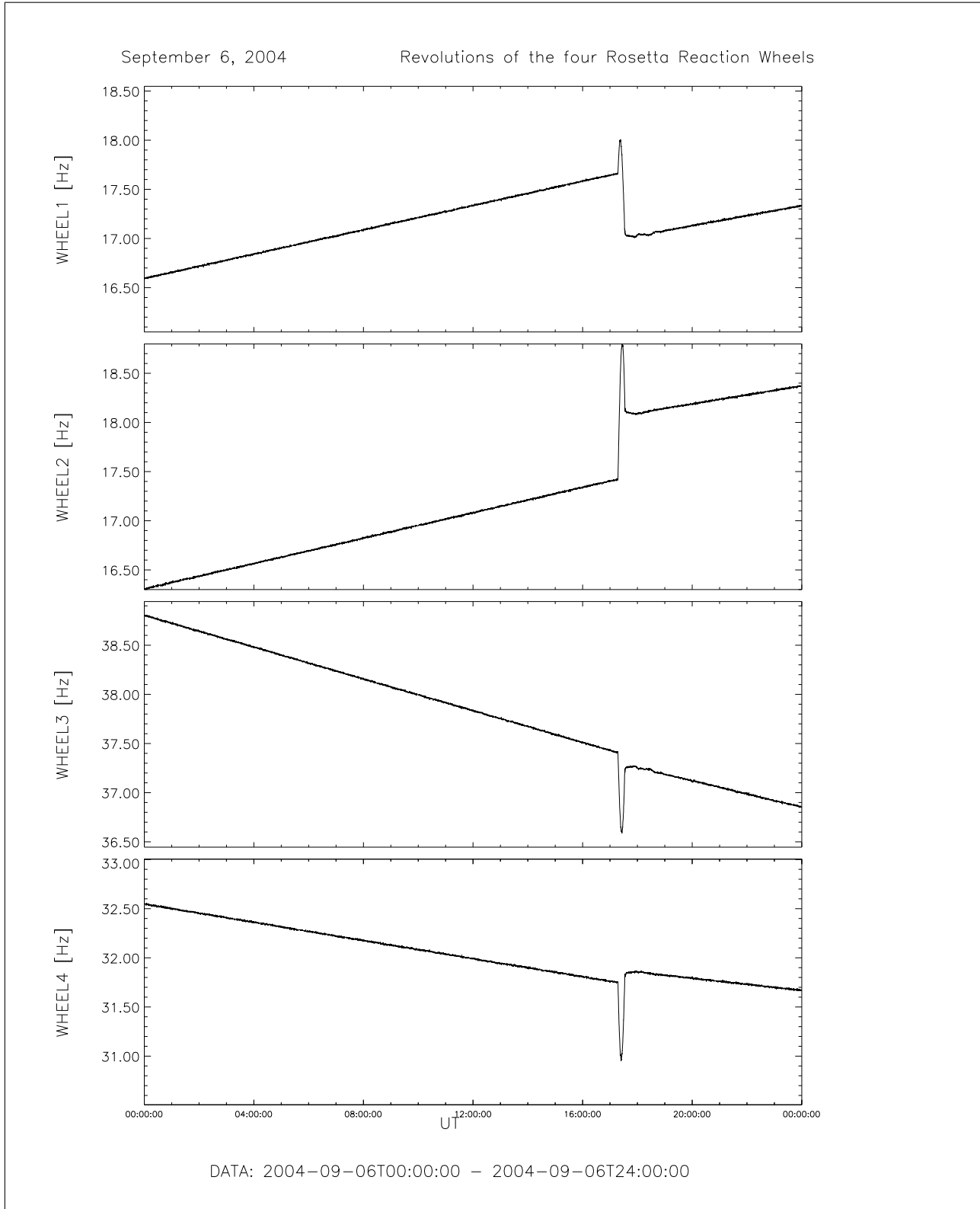


Figure 7: File: wheels\_Hz2004-09-06T00-00

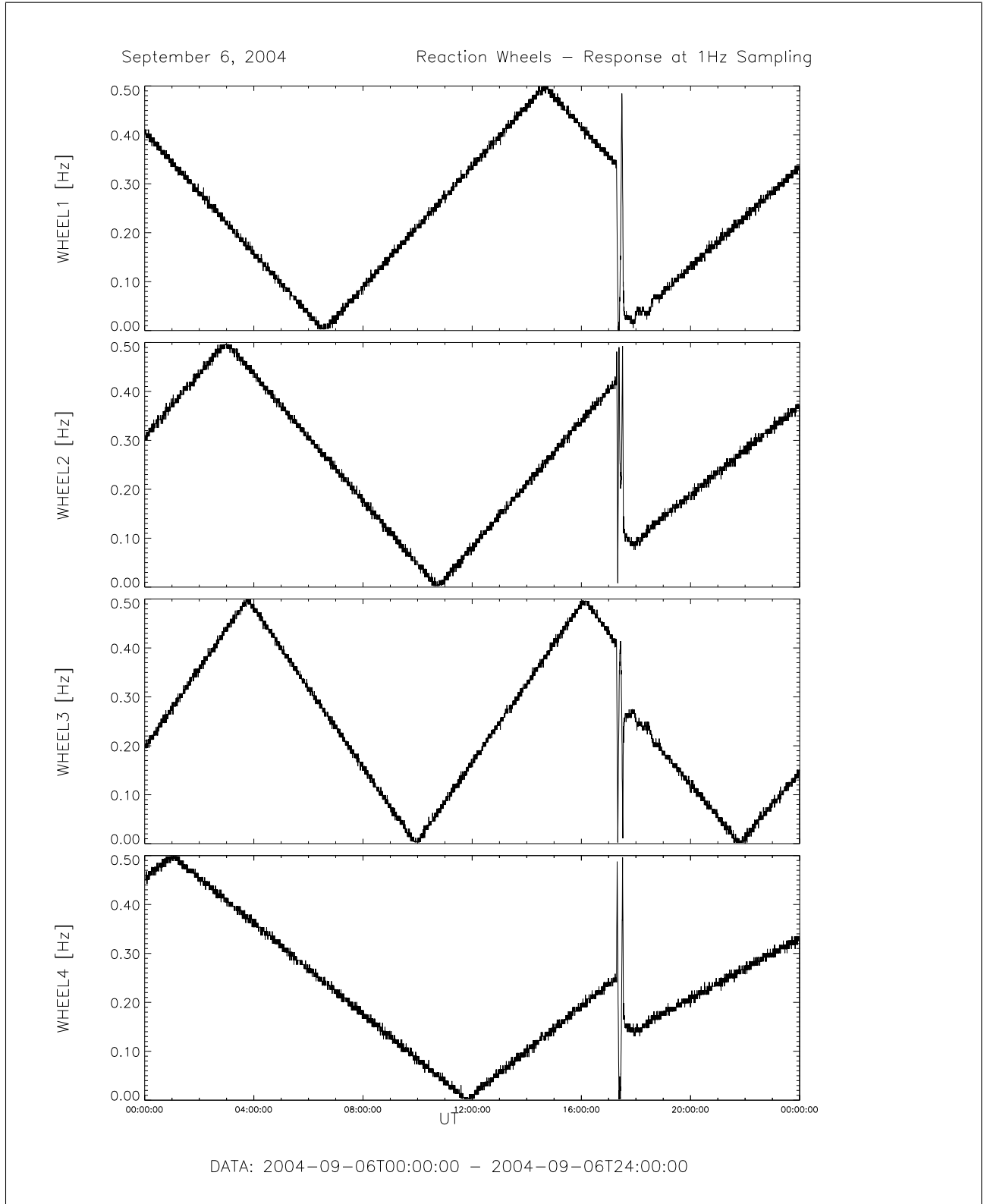


Figure 8: File: wheels\_1Hz\_Sampling2004-09-06T00-00

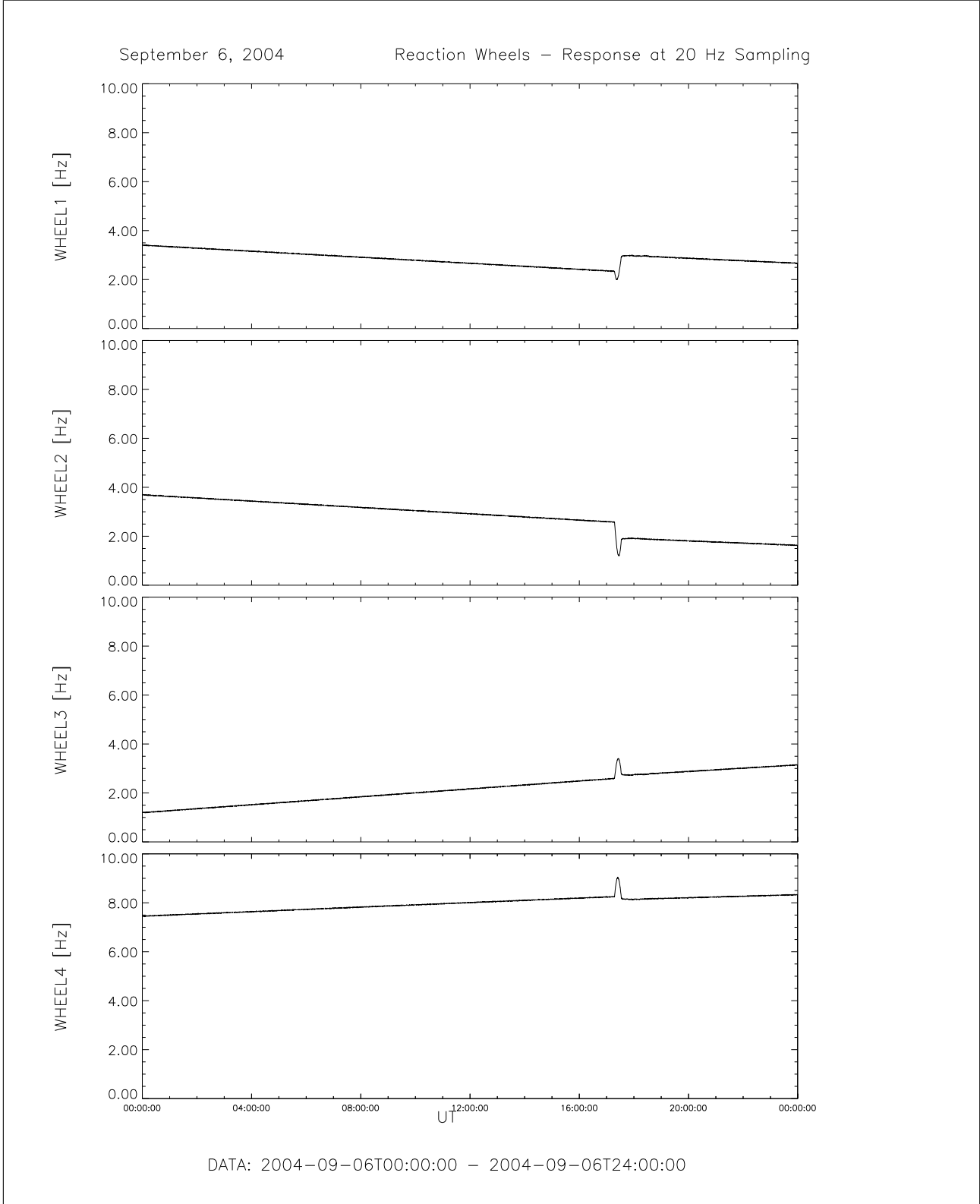


Figure 9: File: wheels\_20Hz\_Sampling2004-09-06T00-00

R O S E T T A	Document: RO-IGEP-TR-0010 Issue: 3 Revision: 2
IGEP Institut für Geophysik u. extraterr. Physik Technische Universität Braunschweig	Date: April 12,2007 Page: 13

### 3 September 07, 2004:

#### 3.1 Actions

Time	Stage A, Stage B, Filter cfg	Stage 1, Stage 2, Stage3	Mode
00:00 – 00:44	0 0 0	0 0 0	SID3
12:26 – 14:19	2 0 0	2 0 0	SID4
14:19 – 24:00	0 0 0	0 0 0	SID3

#### 3.2 Plots of Calibrated Data using the new Temperature Model

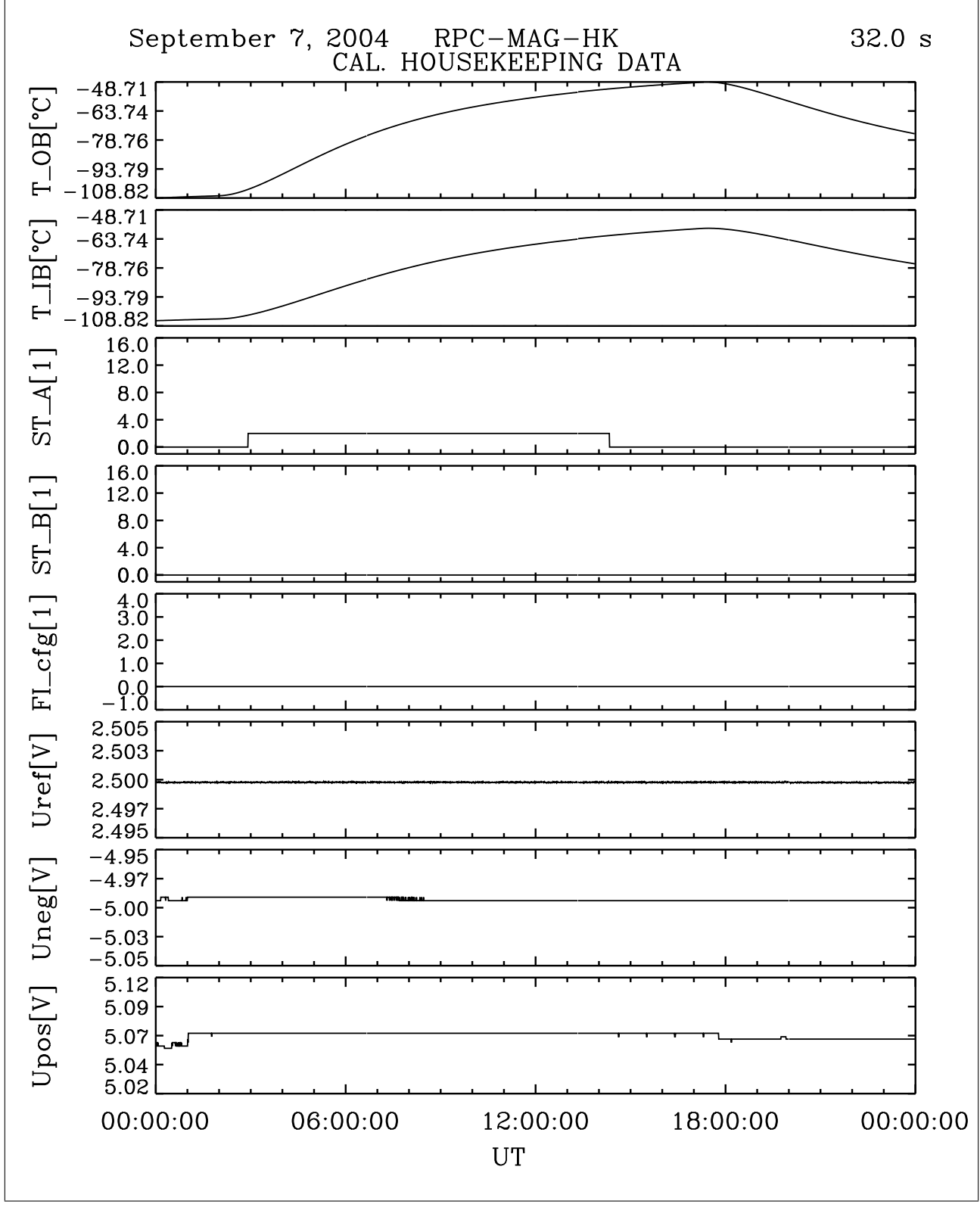


Figure 10: File: RPCMAG040907T0000\_CLA\_HK\_P0000\_2400



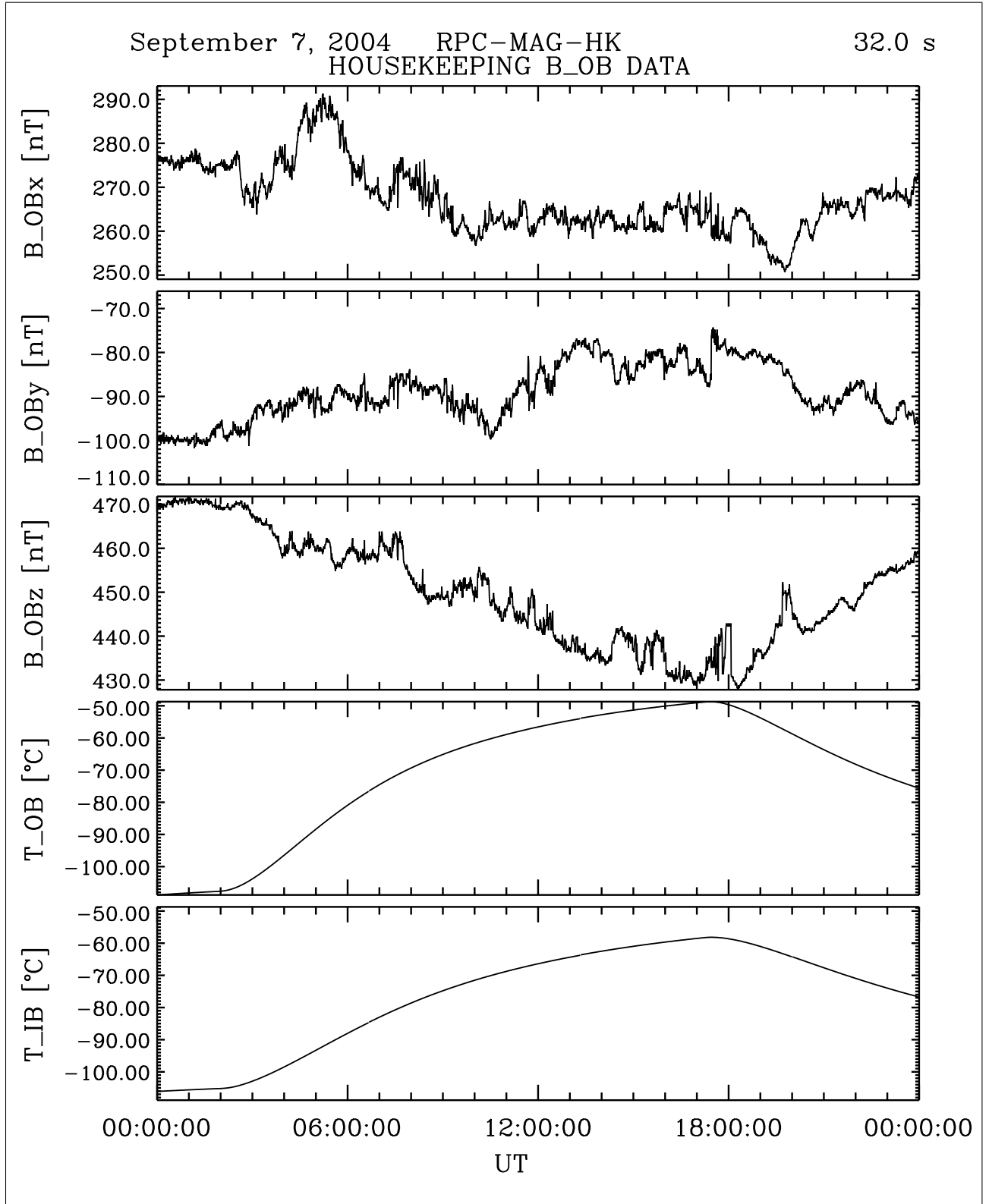


Figure 11: File: RPCMAG040907T0000\_CLA\_HK\_B\_P0000\_2400

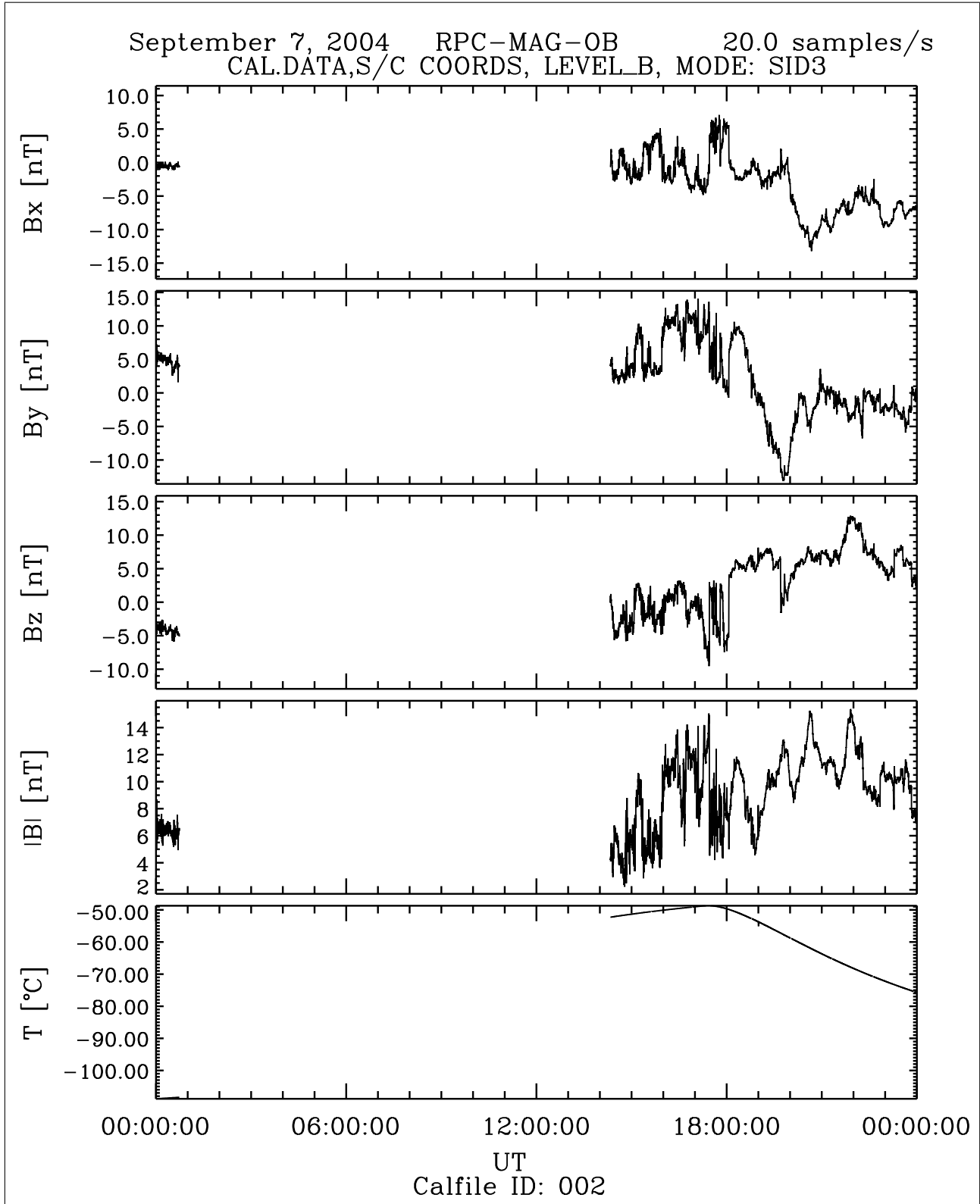


Figure 12: File: RPCMAG040907T0000\_CLB\_OB\_M3\_T0000\_2400\_002

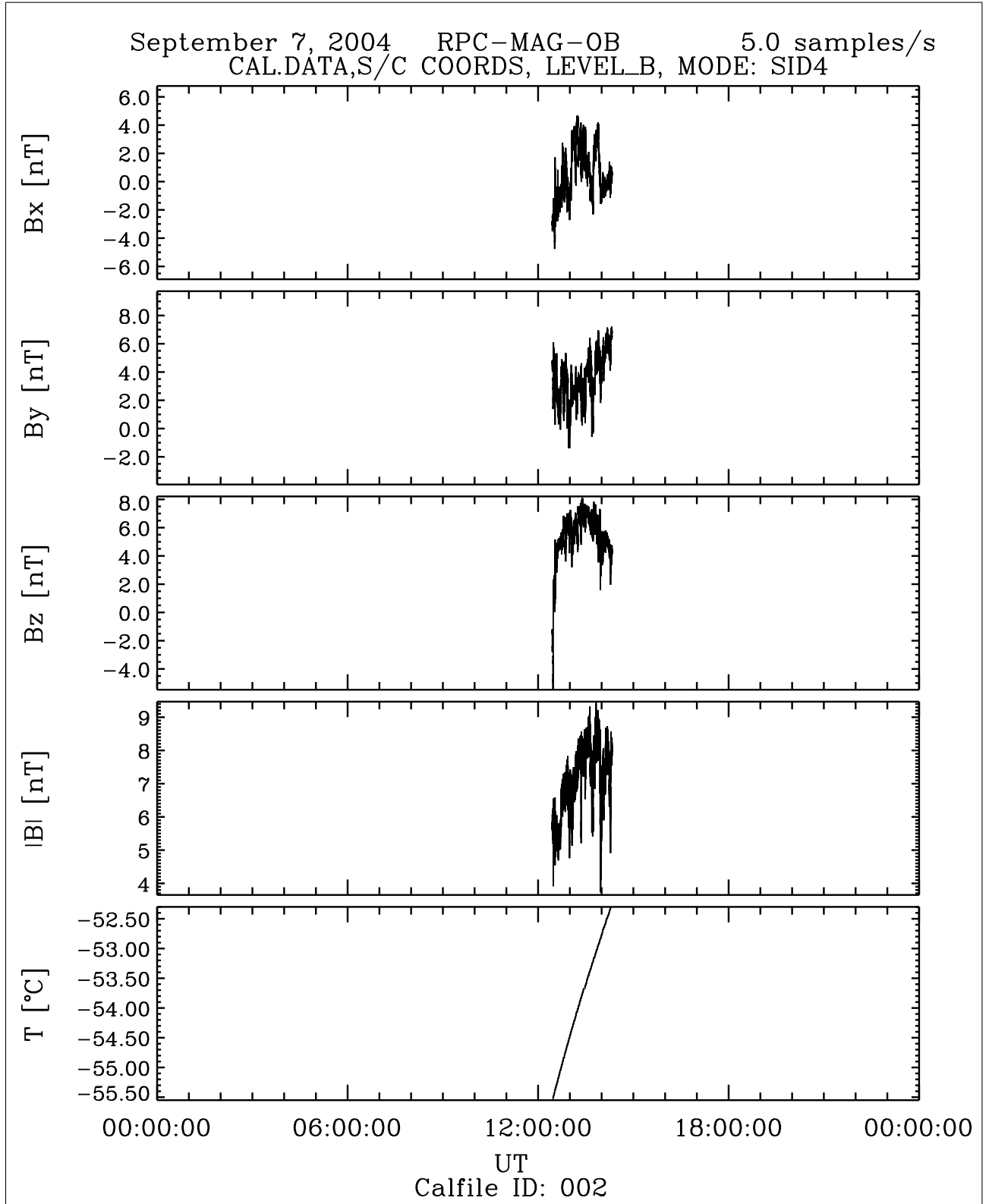


Figure 13: File: RPCMAG040907T1226\_CLB.OB\_M4\_T0000\_2400\_002

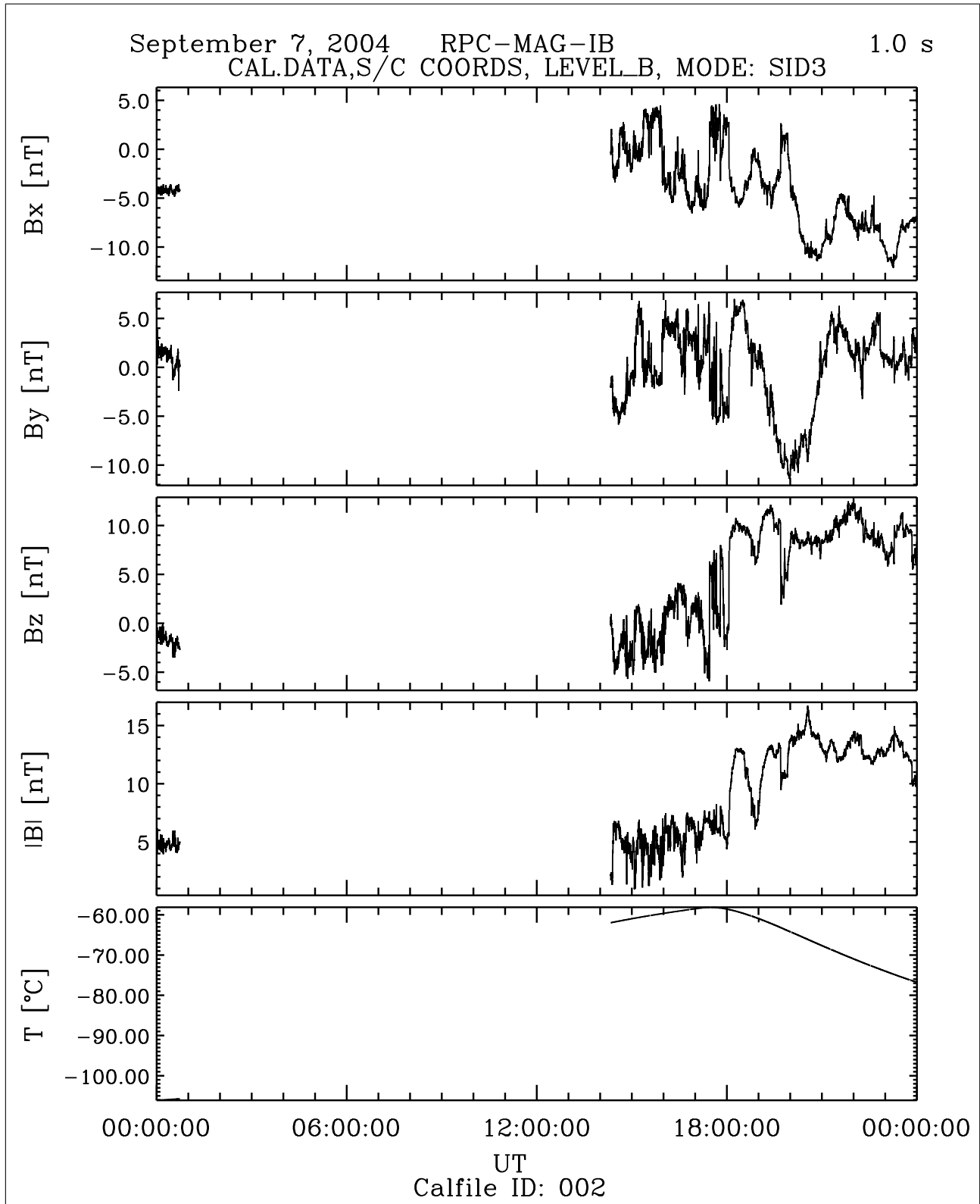


Figure 14: File: RPCMAG040907T0000\_CLB\_IB\_M3\_T0000\_2400\_002

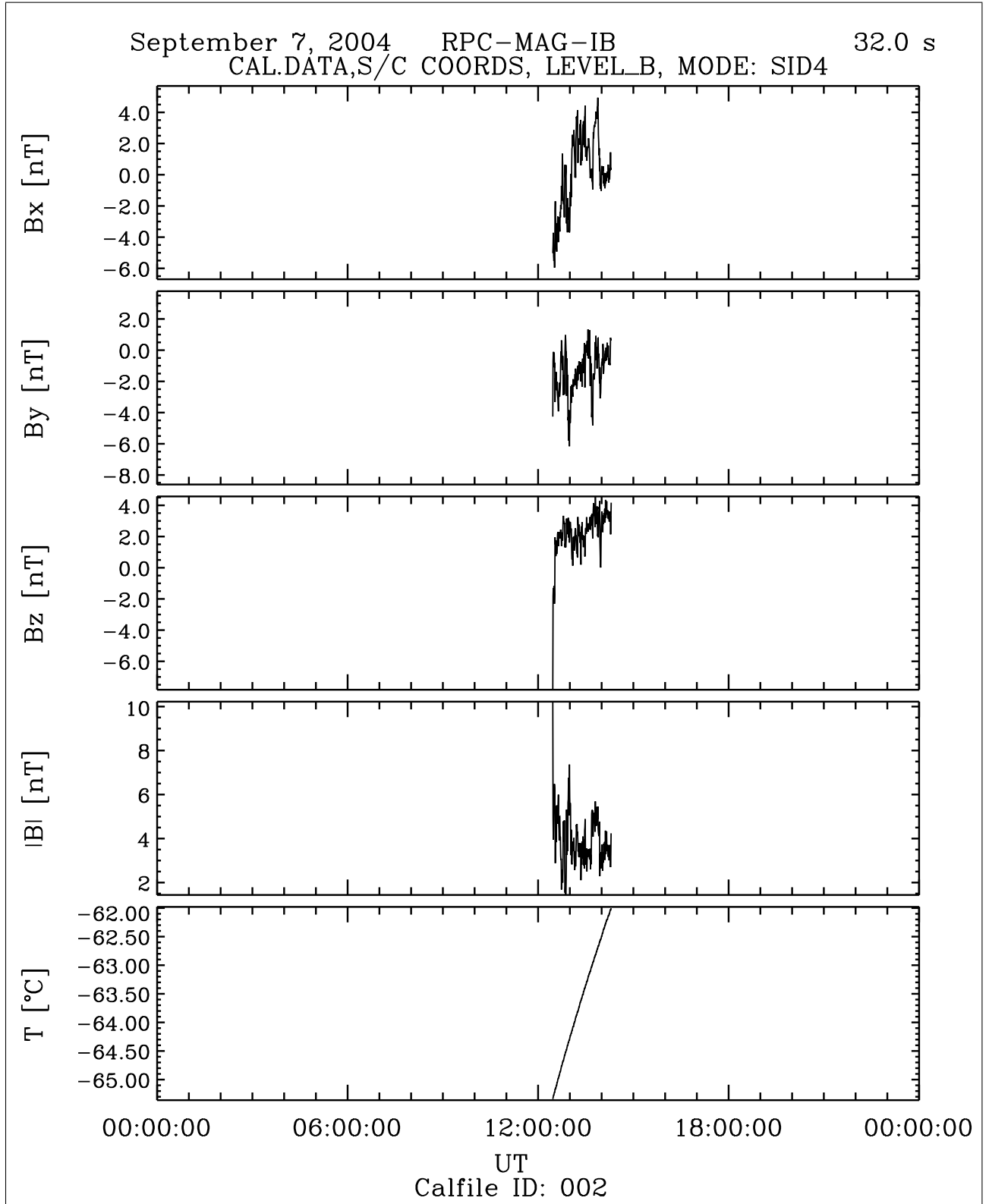


Figure 15: File: RPCMAG040907T1226\_CLB\_IB\_M4\_T0000\_2400\_002

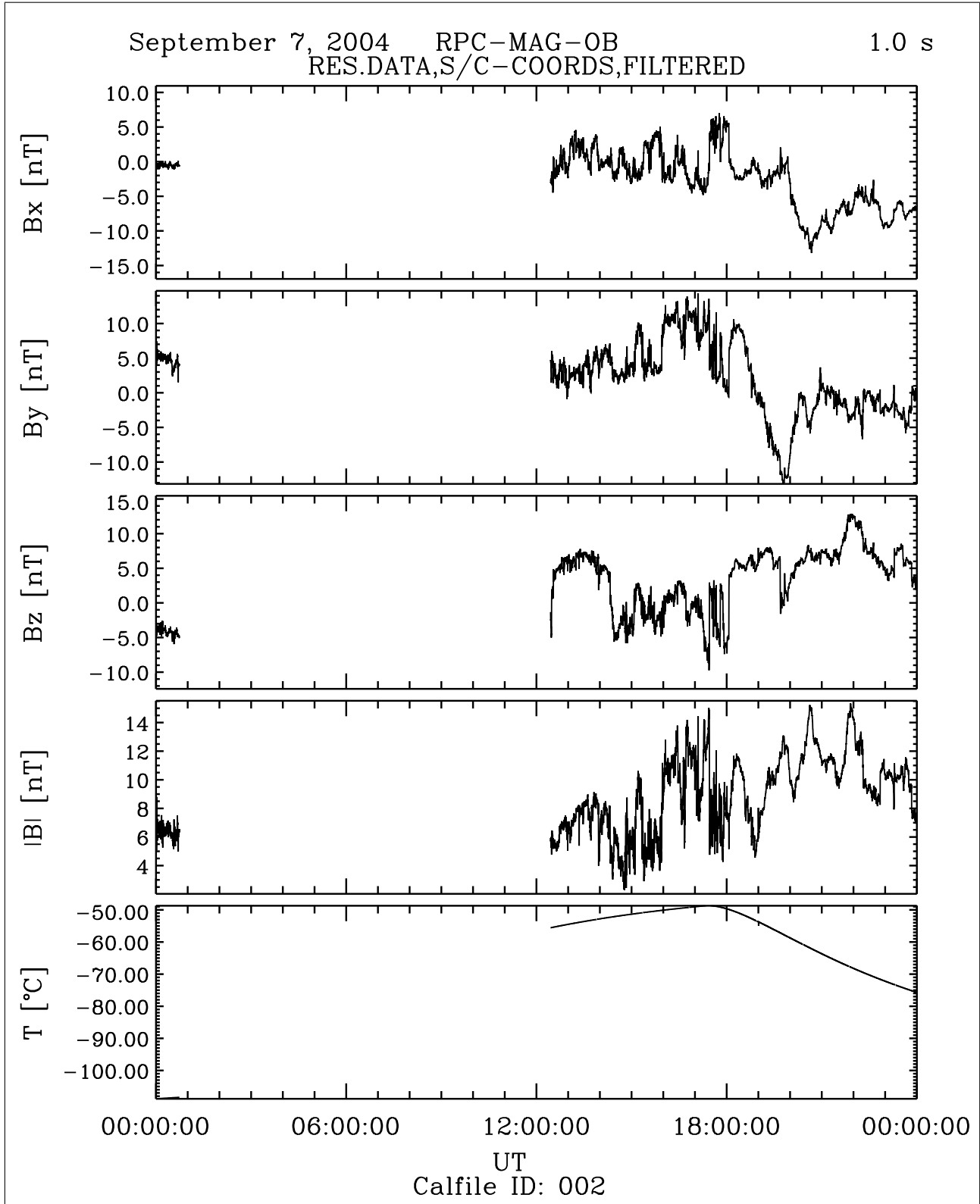


Figure 16: File: RPCMAG040907\_CLF\_OB\_A1\_T0000\_2400\_002

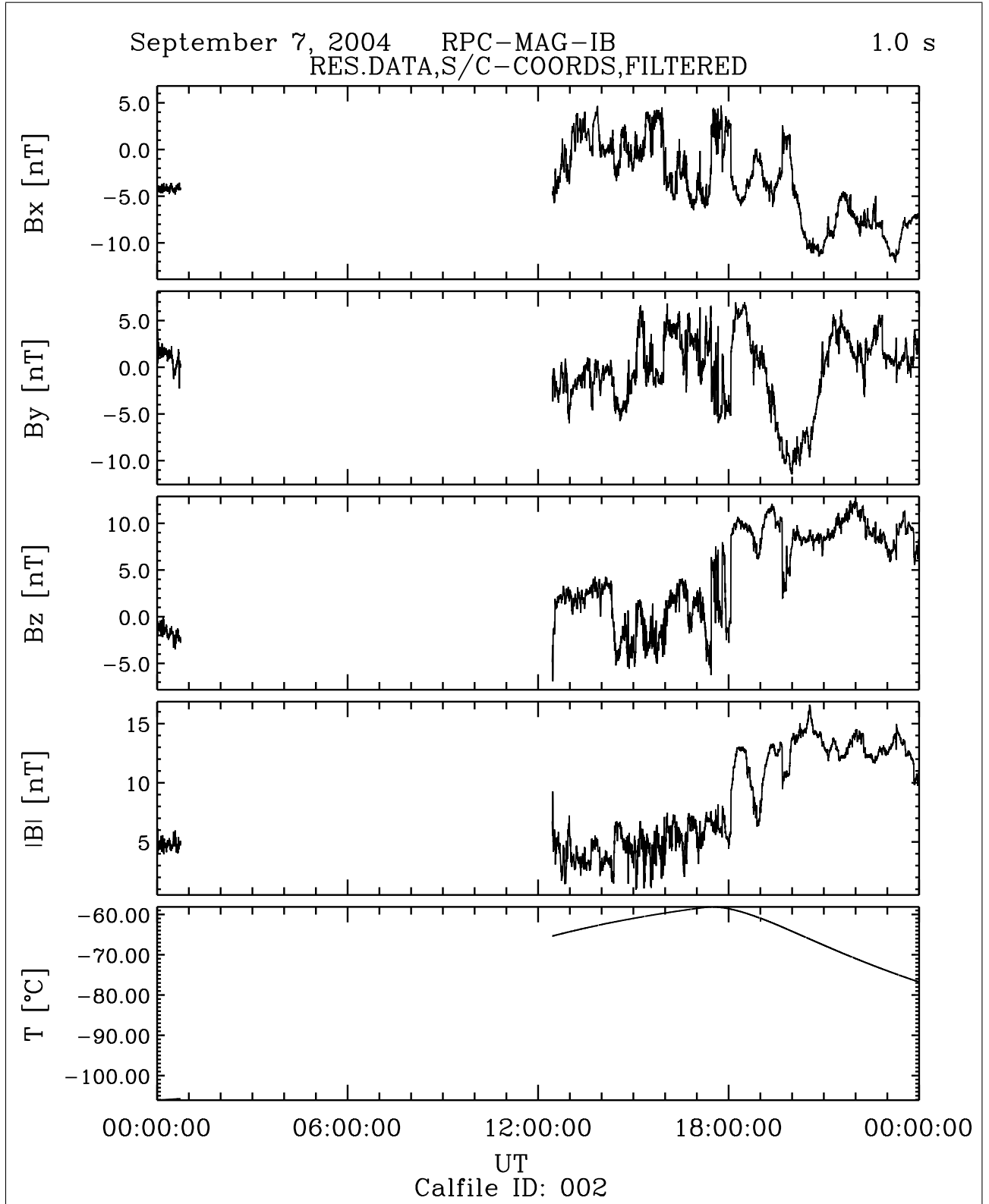


Figure 17: File: RPCMAG040907\_CLF\_IB\_A1\_T0000\_2400\_002

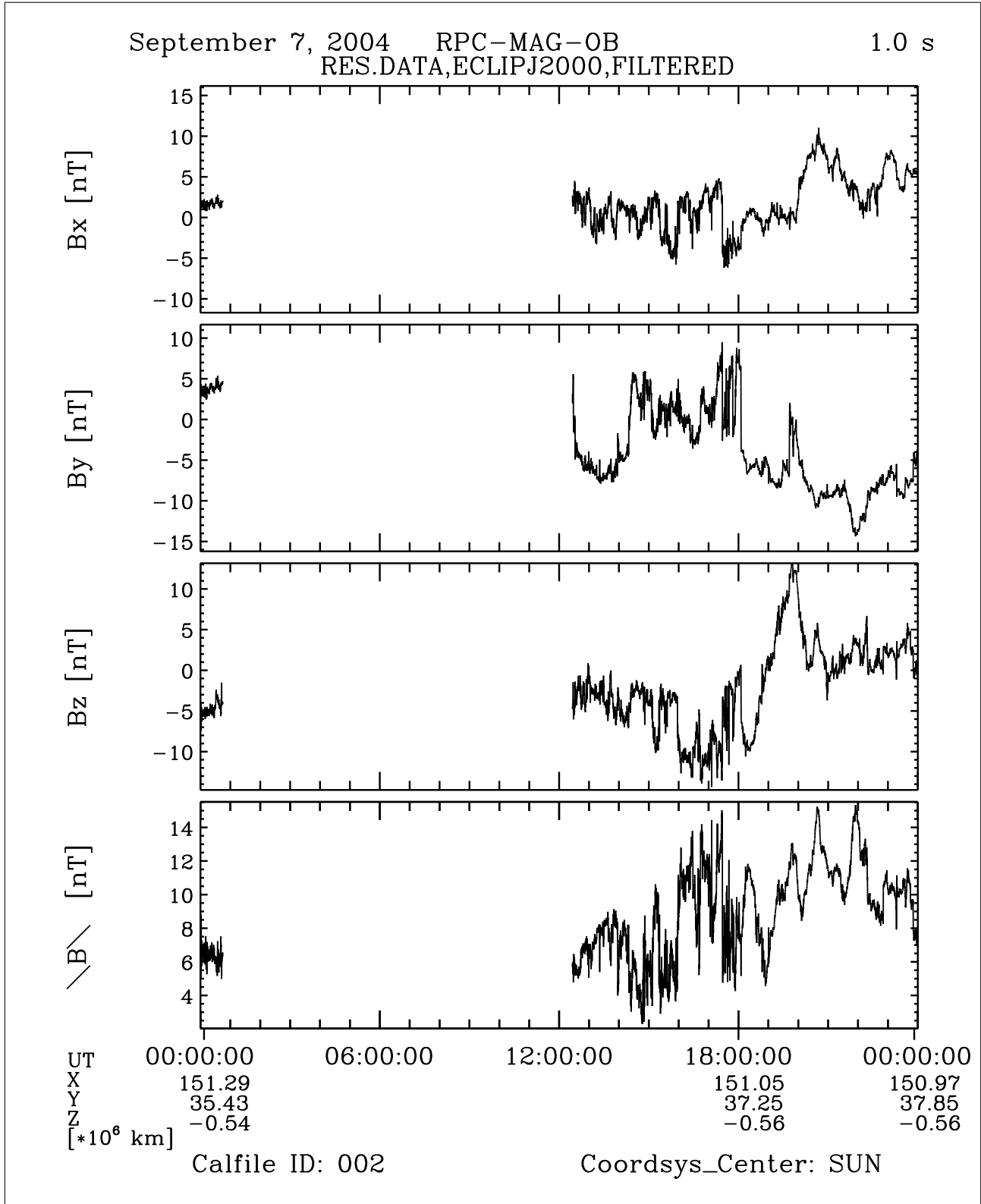


Figure 18: File: RPCMAG040907\_CLG\_OB\_A1.T0000\_2400\_002



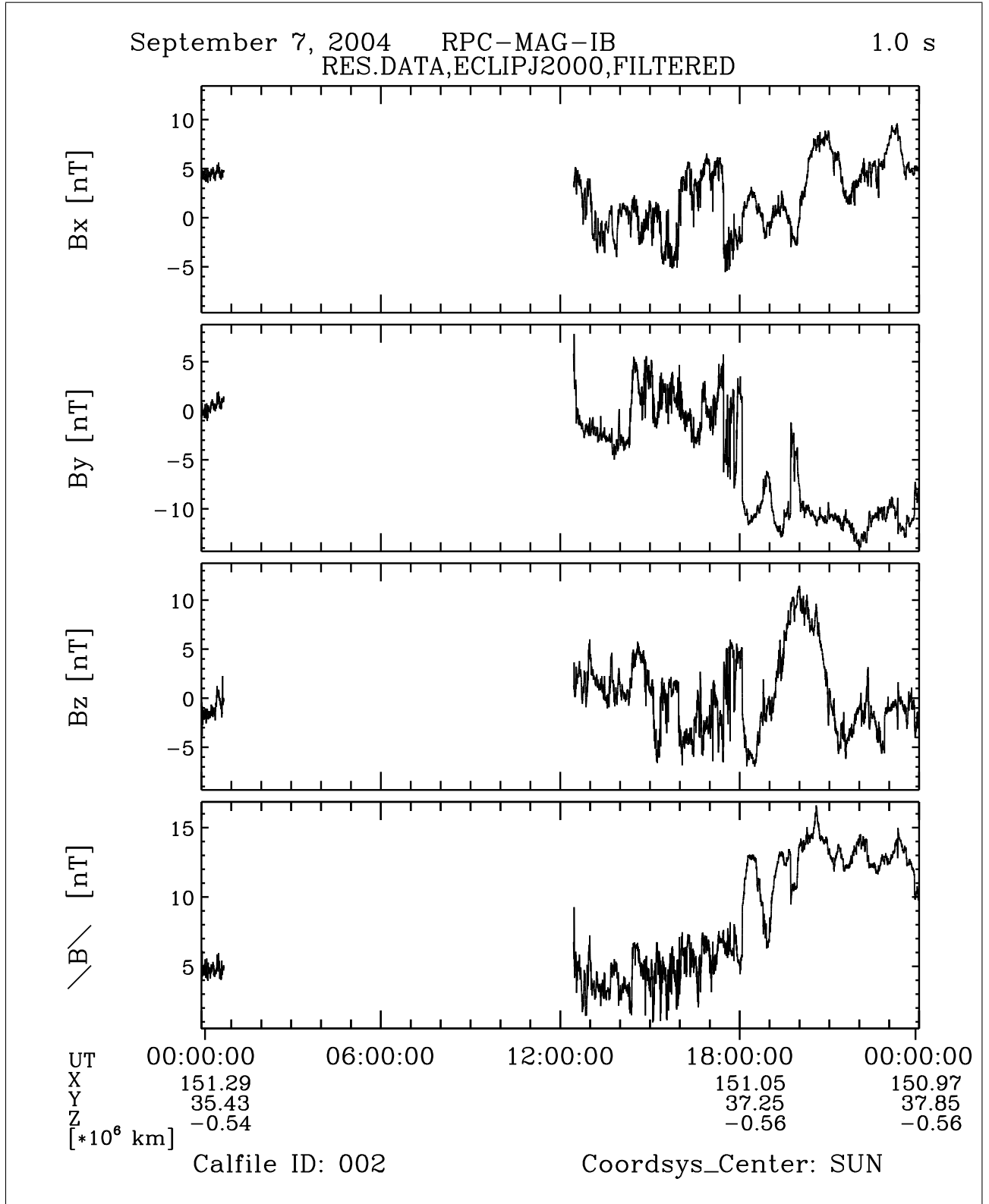


Figure 19: File: RPCMAG040907\_CLG\_IB\_A1\_T0000\_2400\_002

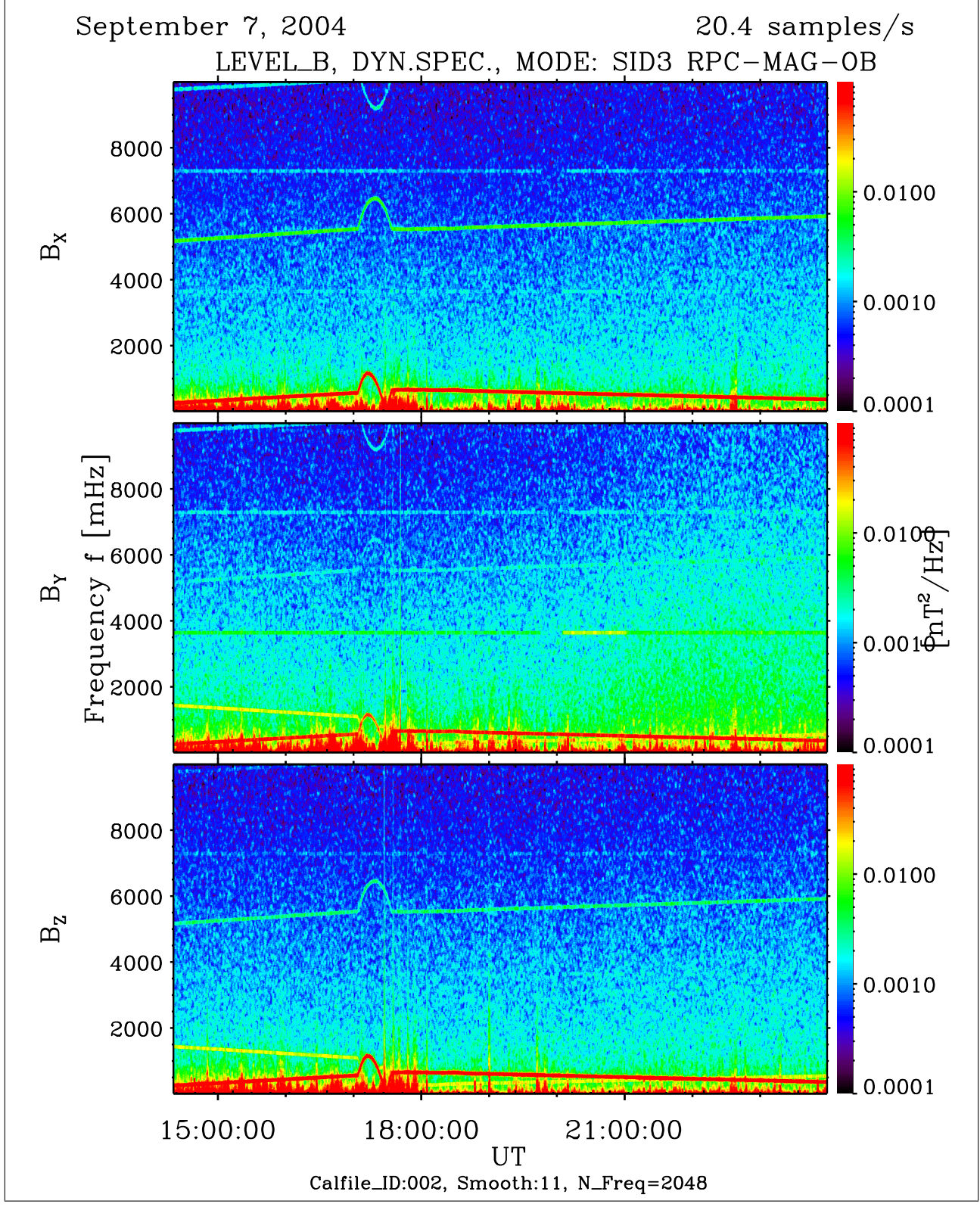


Figure 20: File: RPCMAG040907T0000\_CLB\_OB\_M3\_DS0\_10000\_002

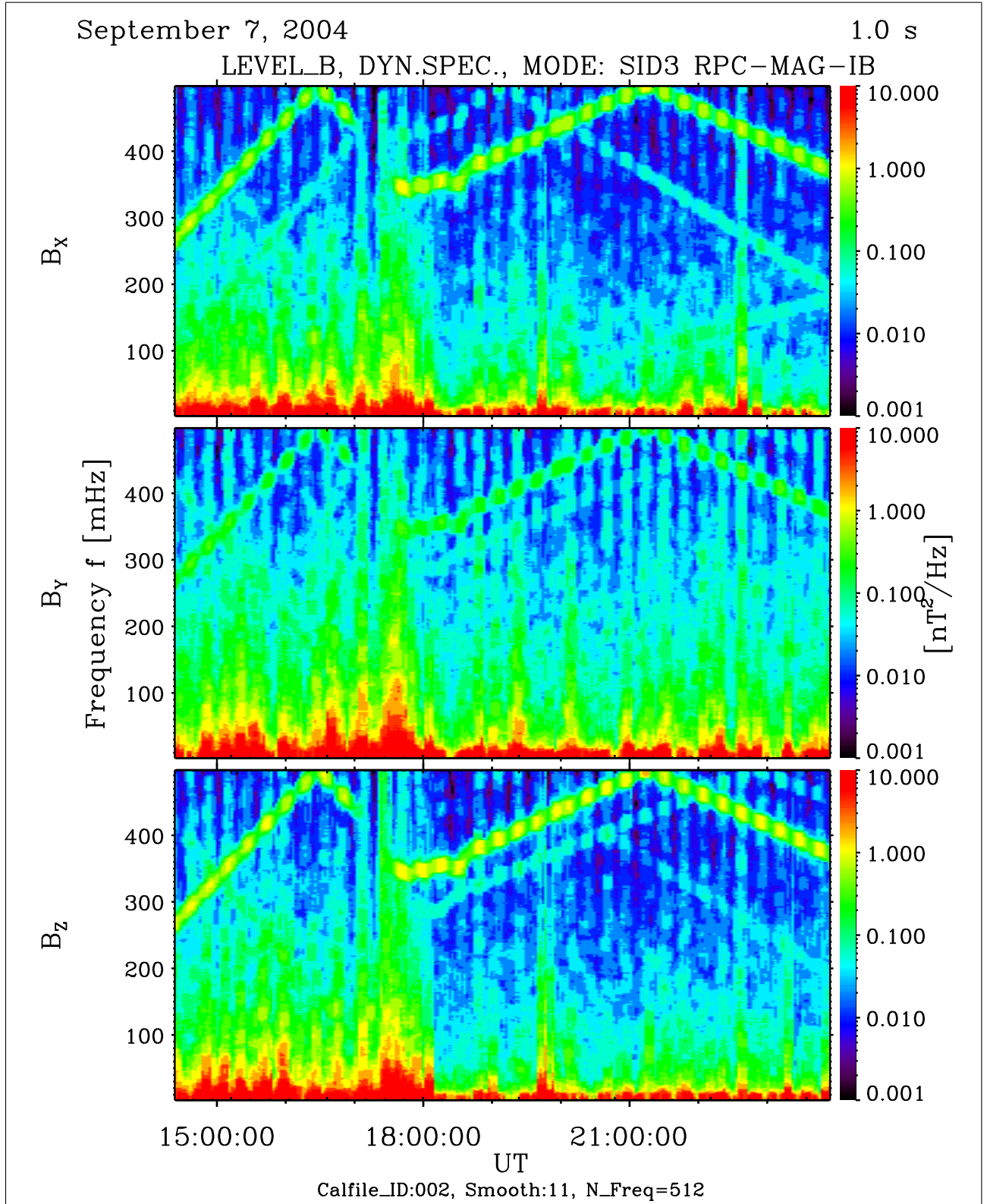


Figure 21: File: RPCMAG040907T0000\_CLB\_IB\_M3\_DS0\_500\_002

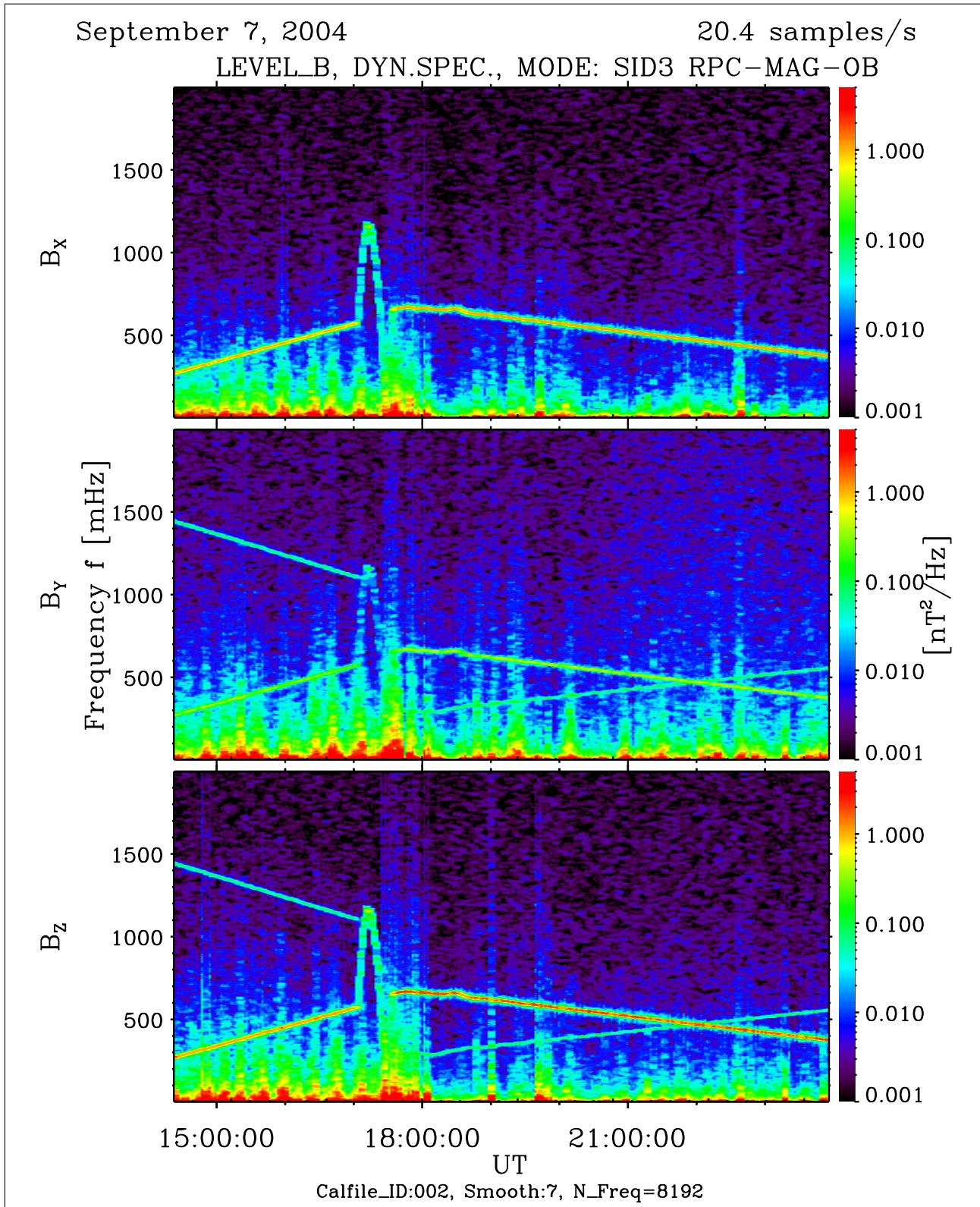


Figure 22: File: RPCMAG040907T0000\_CLB\_OB\_M3\_DS0\_2000\_002

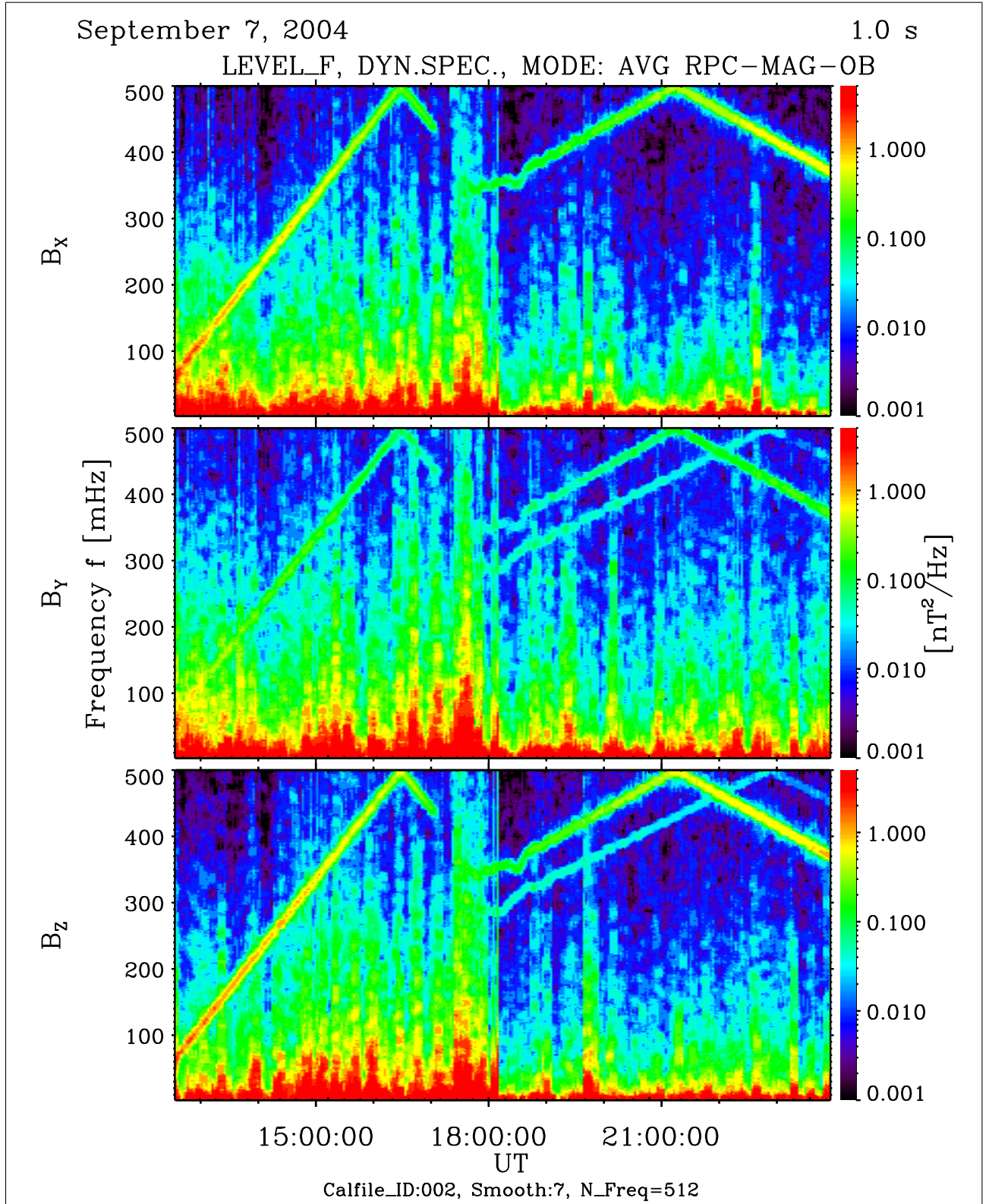


Figure 23: File: RPCMAG040907\_CLF\_OB\_A1\_DS0\_1000\_002

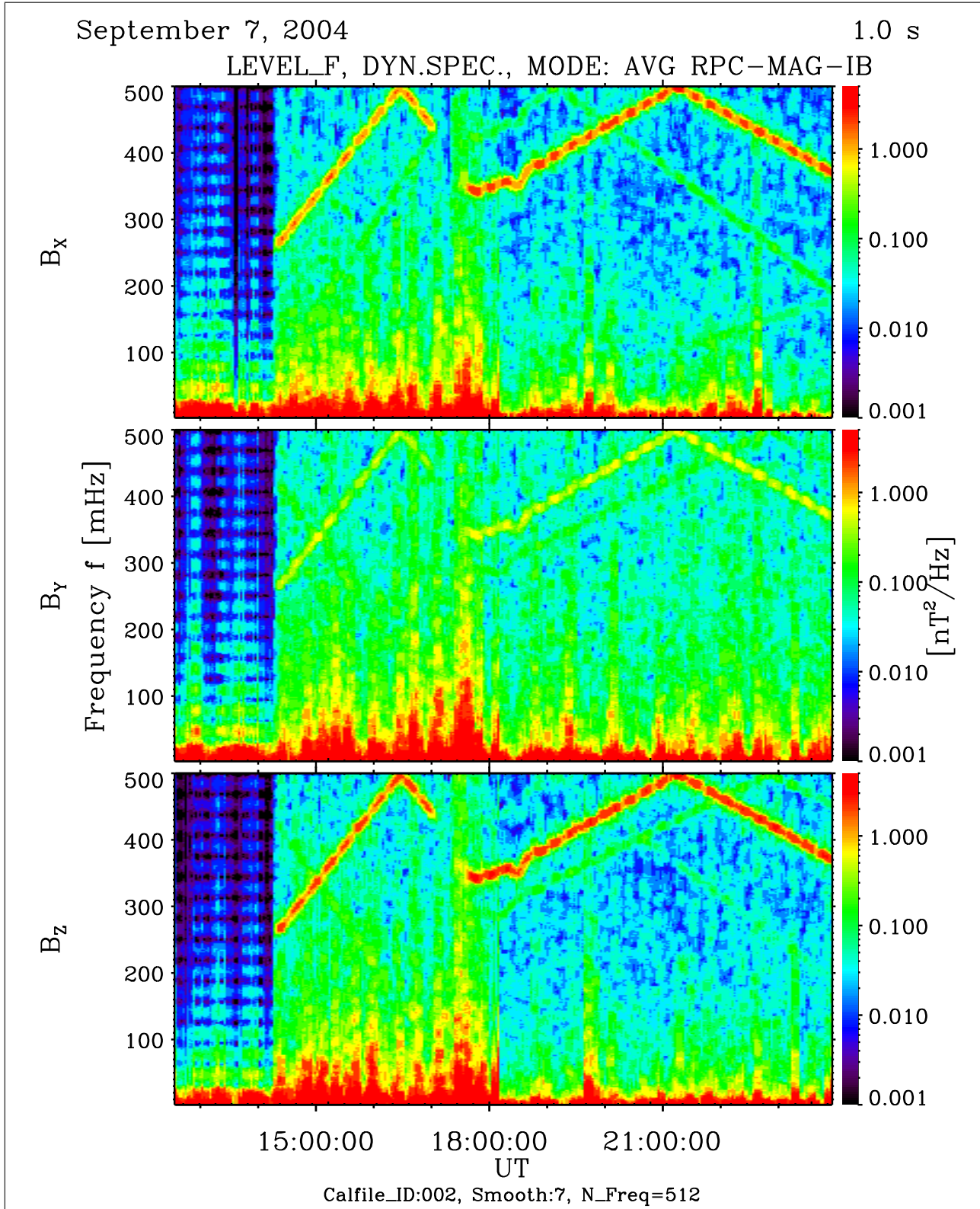


Figure 24: File: RPCMAG040907\_CLF\_IB\_A1\_DS0\_1000\_002

R O S E T T A		Document: RO-IGEP-TR-0010
		Issue: 3
		Revision: 2
IGEP	Institut für Geophysik u. extraterr. Physik	Date: April 12, 2007
	Technische Universität Braunschweig	Page: 29

### 3.3 Plots of ROSETTA's Reaction Wheels Speeds

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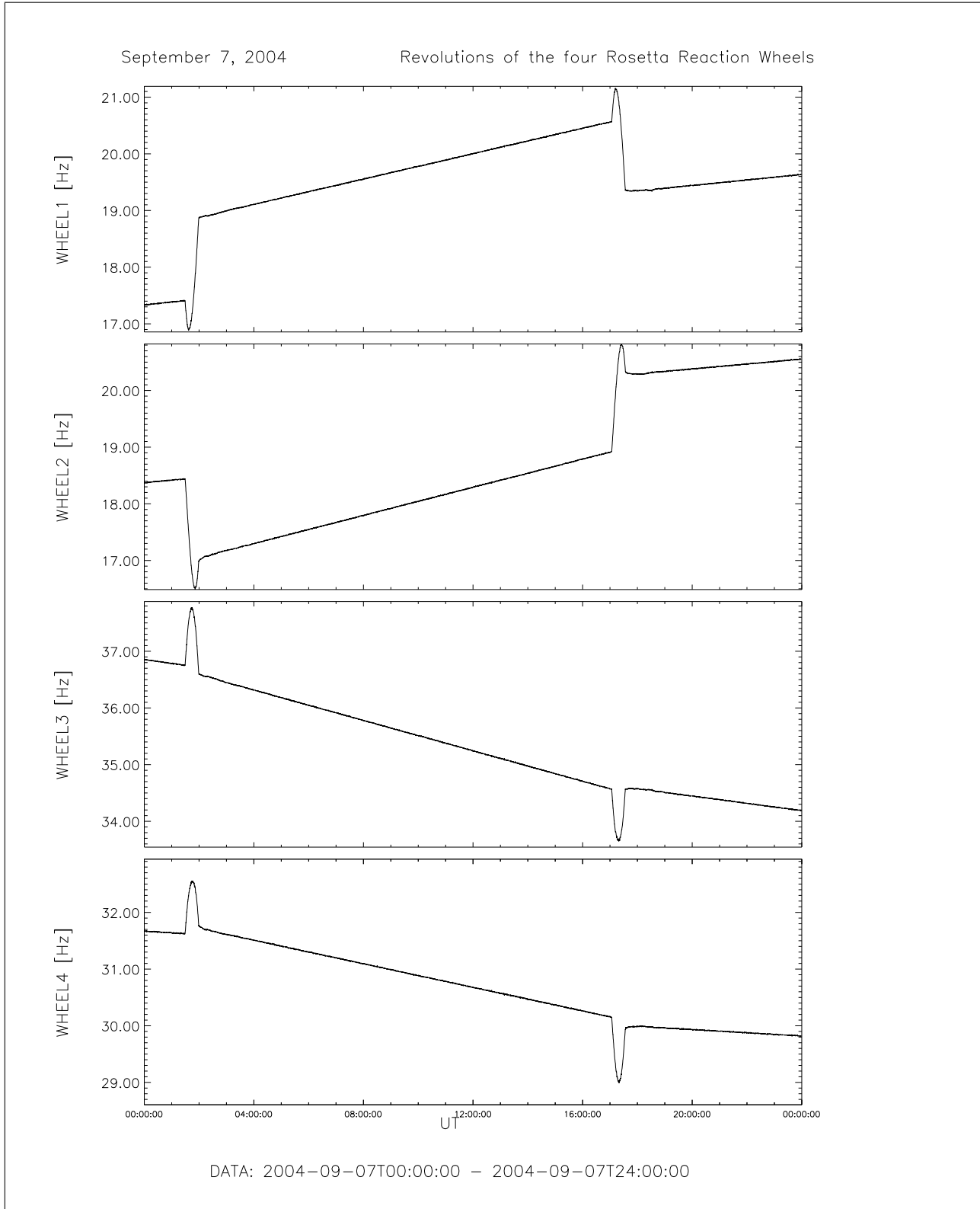


Figure 25: File: wheels\_Hz2004-09-07T00-00



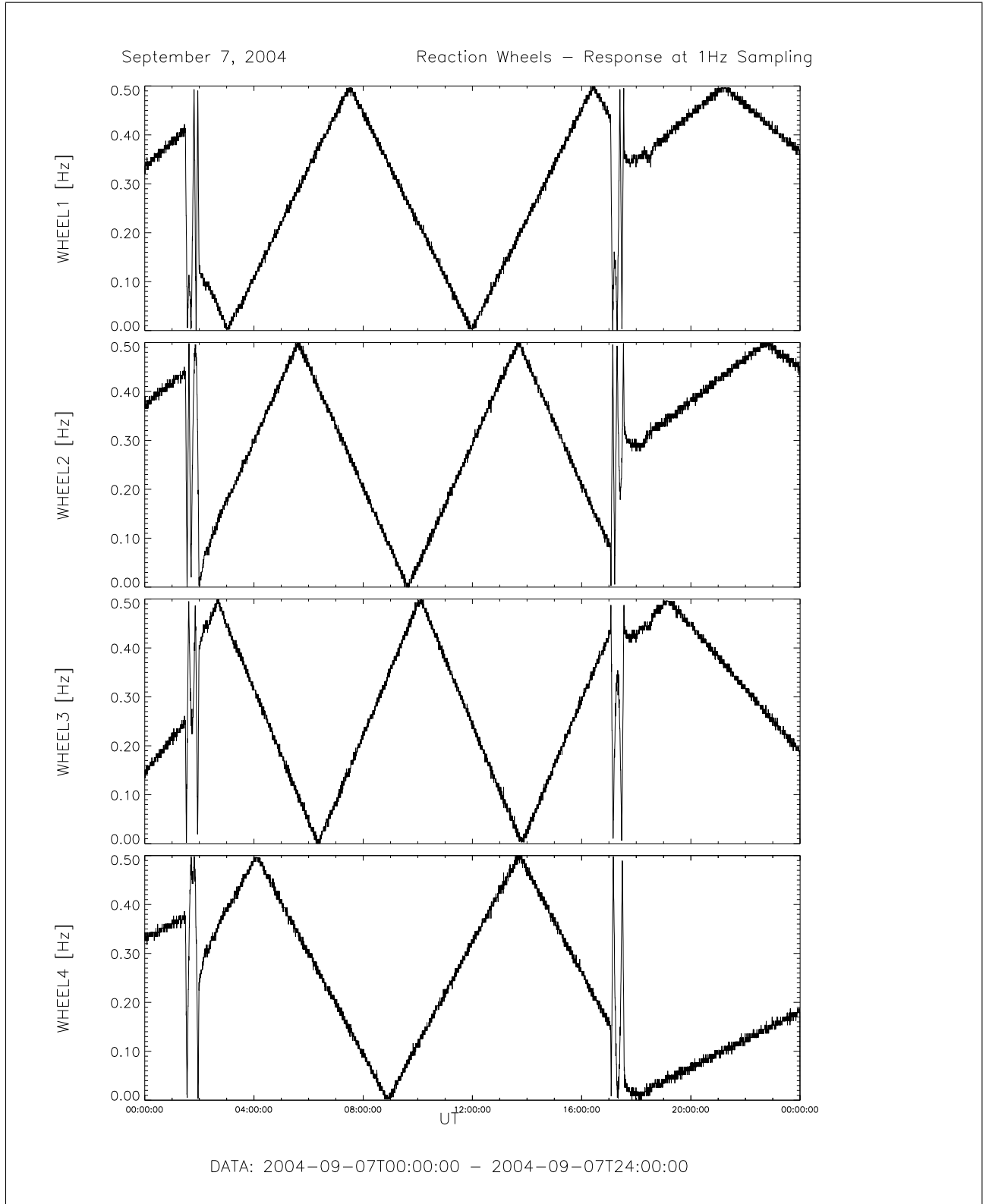


Figure 26: File: wheels\_1Hz\_Sampling2004-09-07T00-00

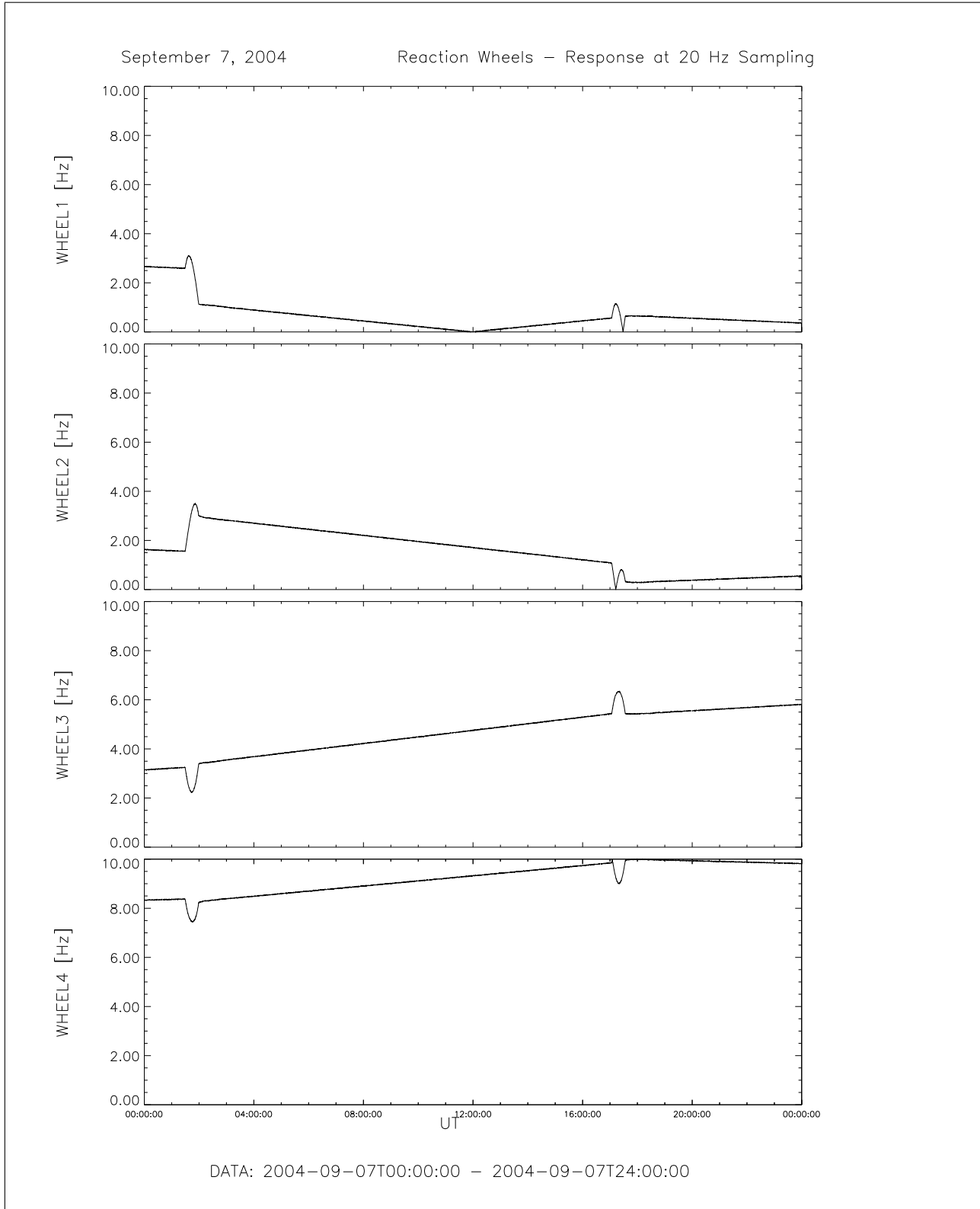


Figure 27: File: wheels\_20Hz\_Sampling2004-09-07T00-00

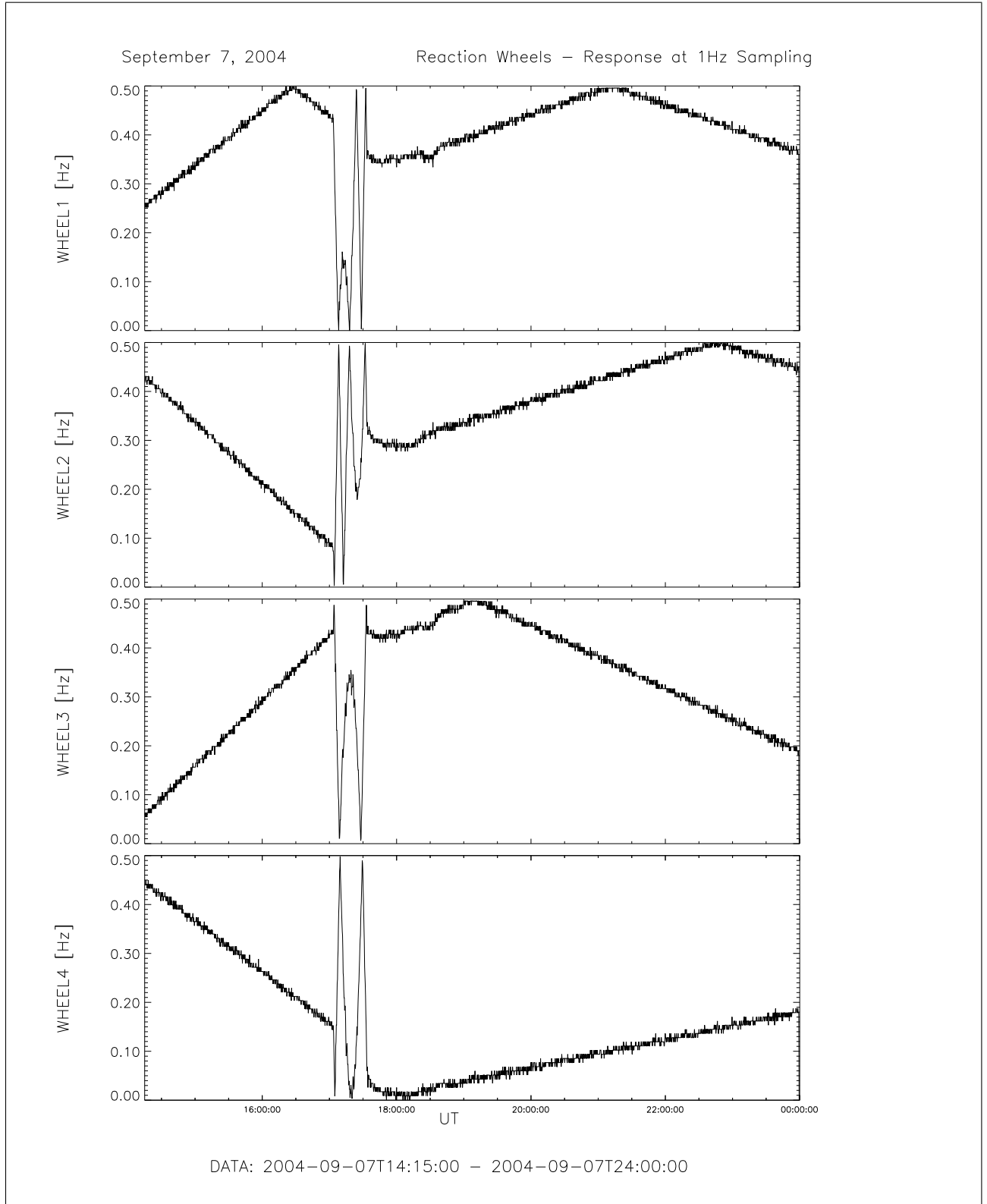


Figure 28: File: wheels\_1Hz\_Sampling2004-09-07T14-15

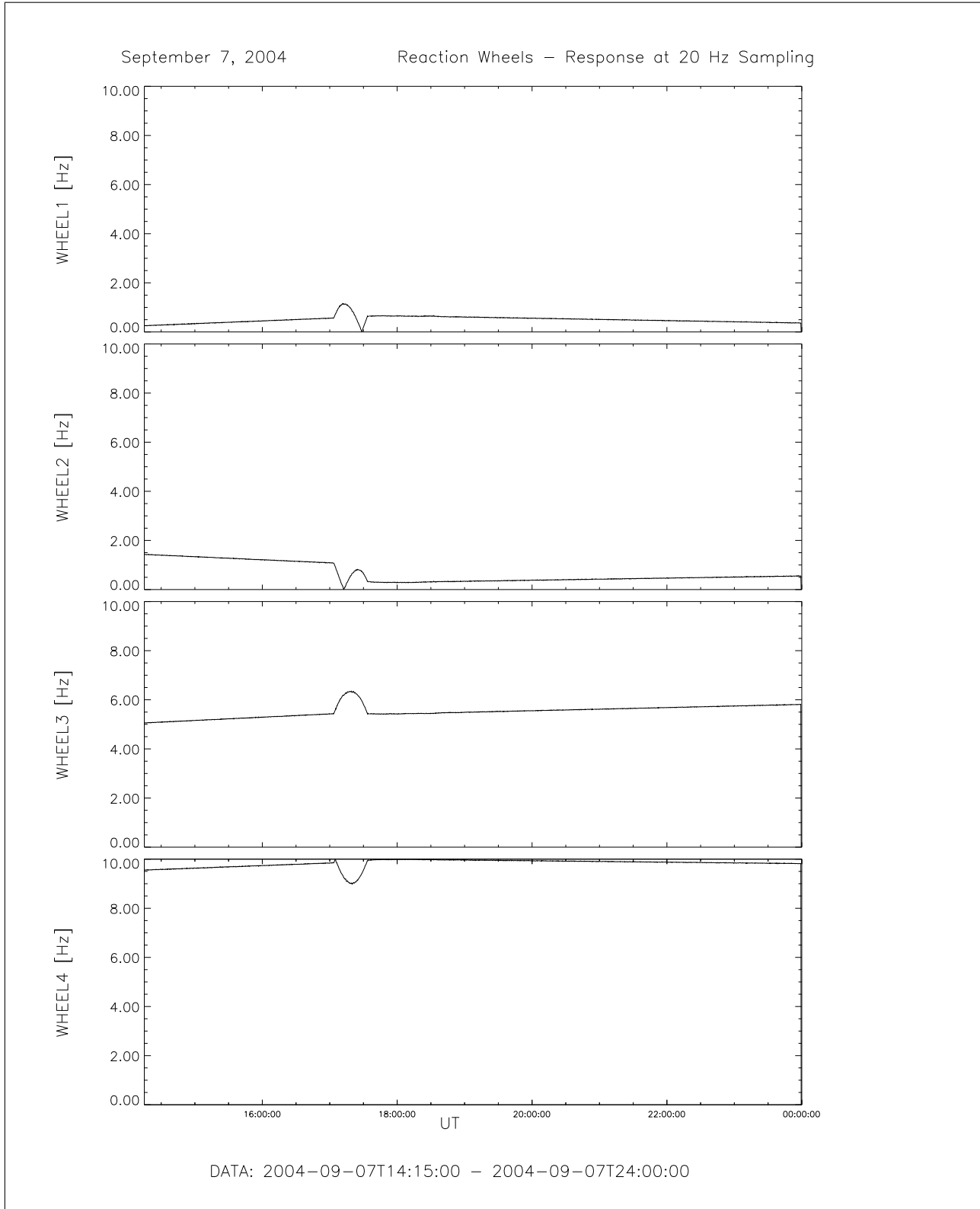


Figure 29: File: wheels\_20Hz\_Sampling2004-09-07T14-15

R O S E T T A		Document: RO-IGEP-TR-0010
		Issue: 3
		Revision: 2
IGEP	Institut für Geophysik u. extraterr. Physik	Date: April 12,2007
	Technische Universität Braunschweig	Page: 35

## 4 September 08, 2004:

### 4.1 Actions

Time	Stage A, Stage B, Filter cfg	Stage 1, Stage 2, Stage3	Mode
00:00 – 00:44	0 0 0	0 0 0	SID3
03:58 – 14:54	0 0 0	0 0 0	SID3
14:54 – 17:48	2 0 0	2 0 0	SID4
17:48 – 19:07	0 0 0	0 0 0	SID3
19:07 – 22:02	1 2 0	1 2 0	SID2
22:03 – 23:56	0 0 0	0 0 0	SID3
23:56 – 24:00	2 0 0	2 0 0	SID4

### 4.2 Plots of Calibrated Data using the new Temperature Model

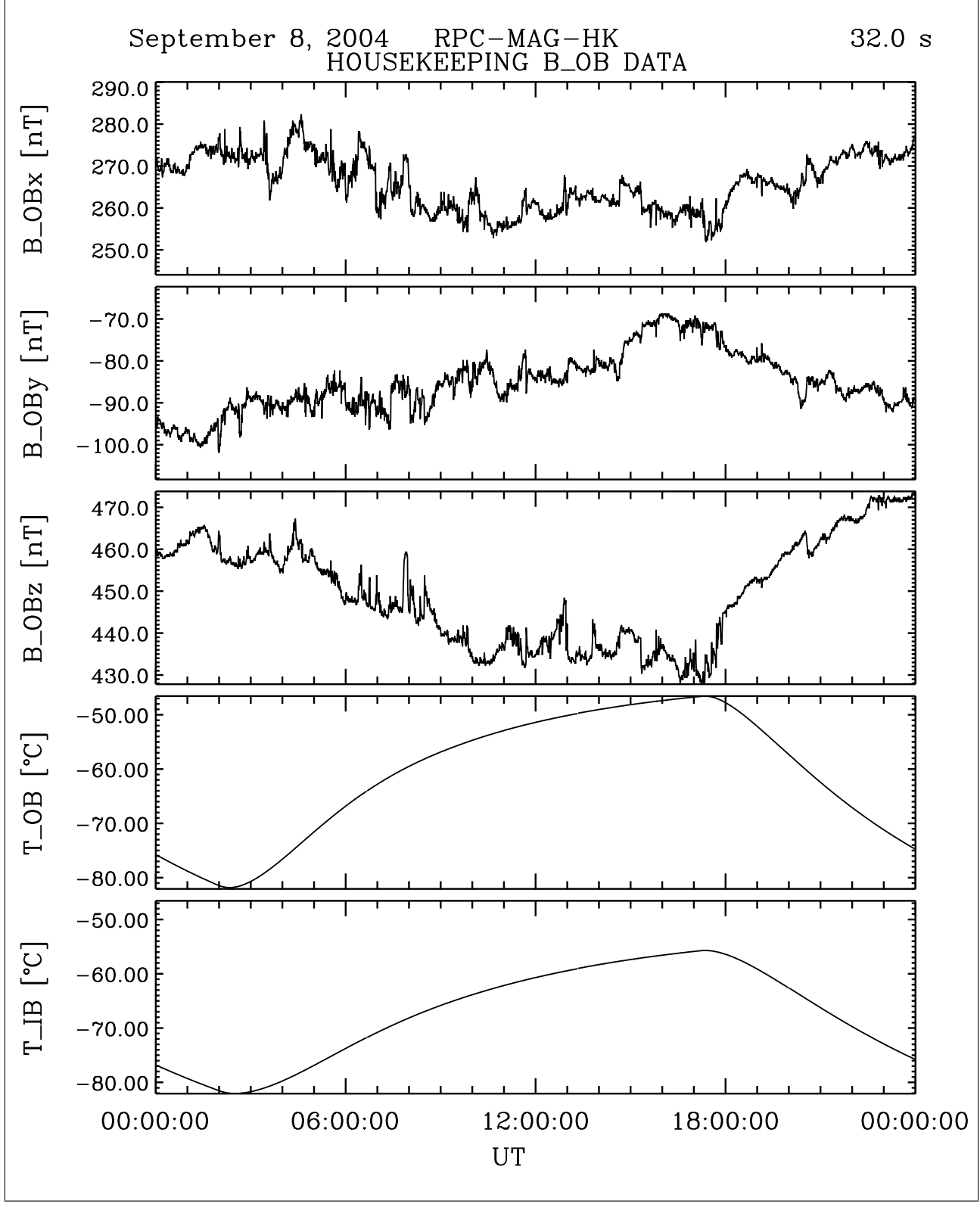


Figure 30: File: RPCMAG040908T0000\_CLA\_HK\_B\_P0000\_2400

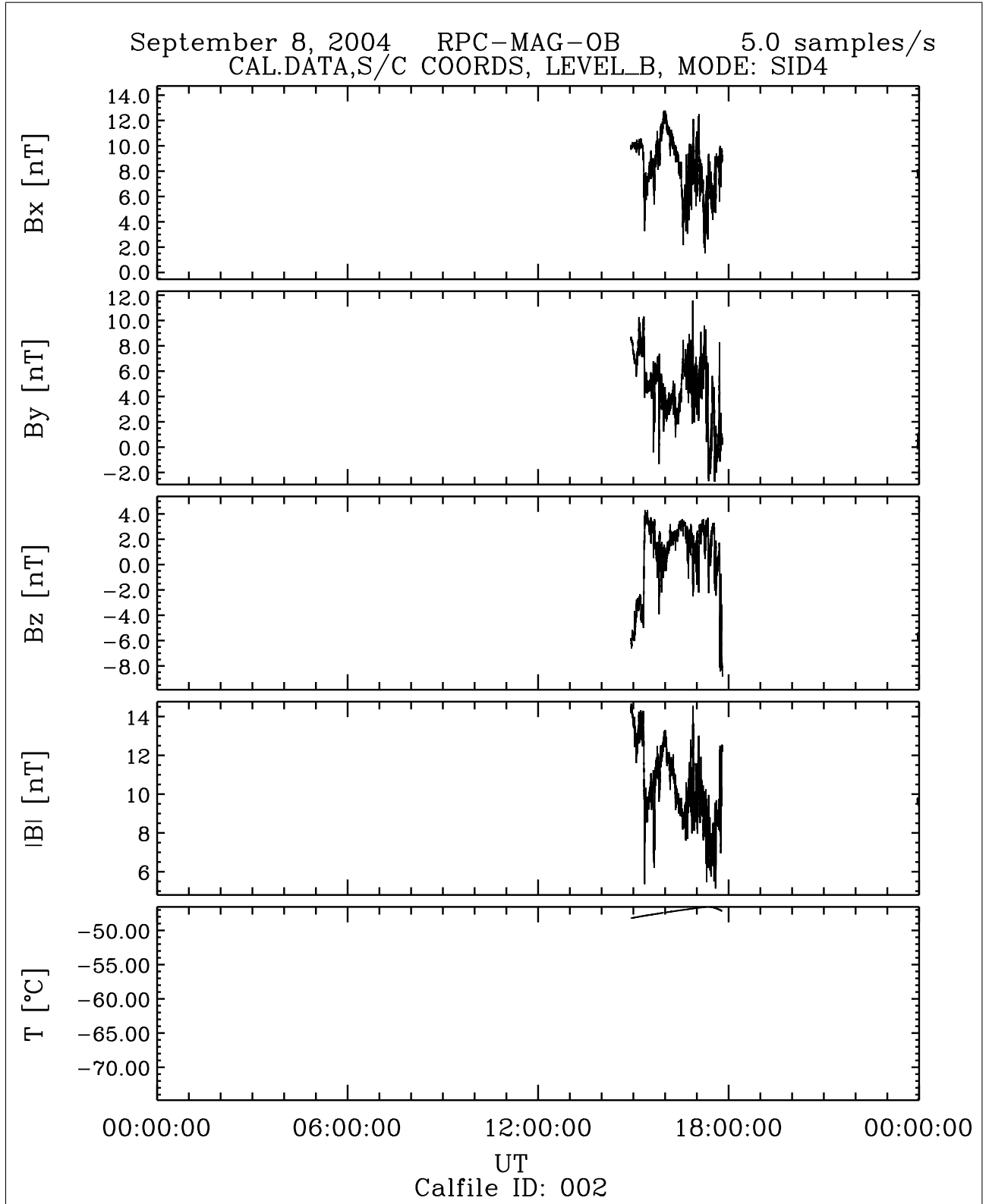


Figure 31: File: RPCMAG040908T1454\_CLB\_OB\_M4\_T0000\_2400\_002

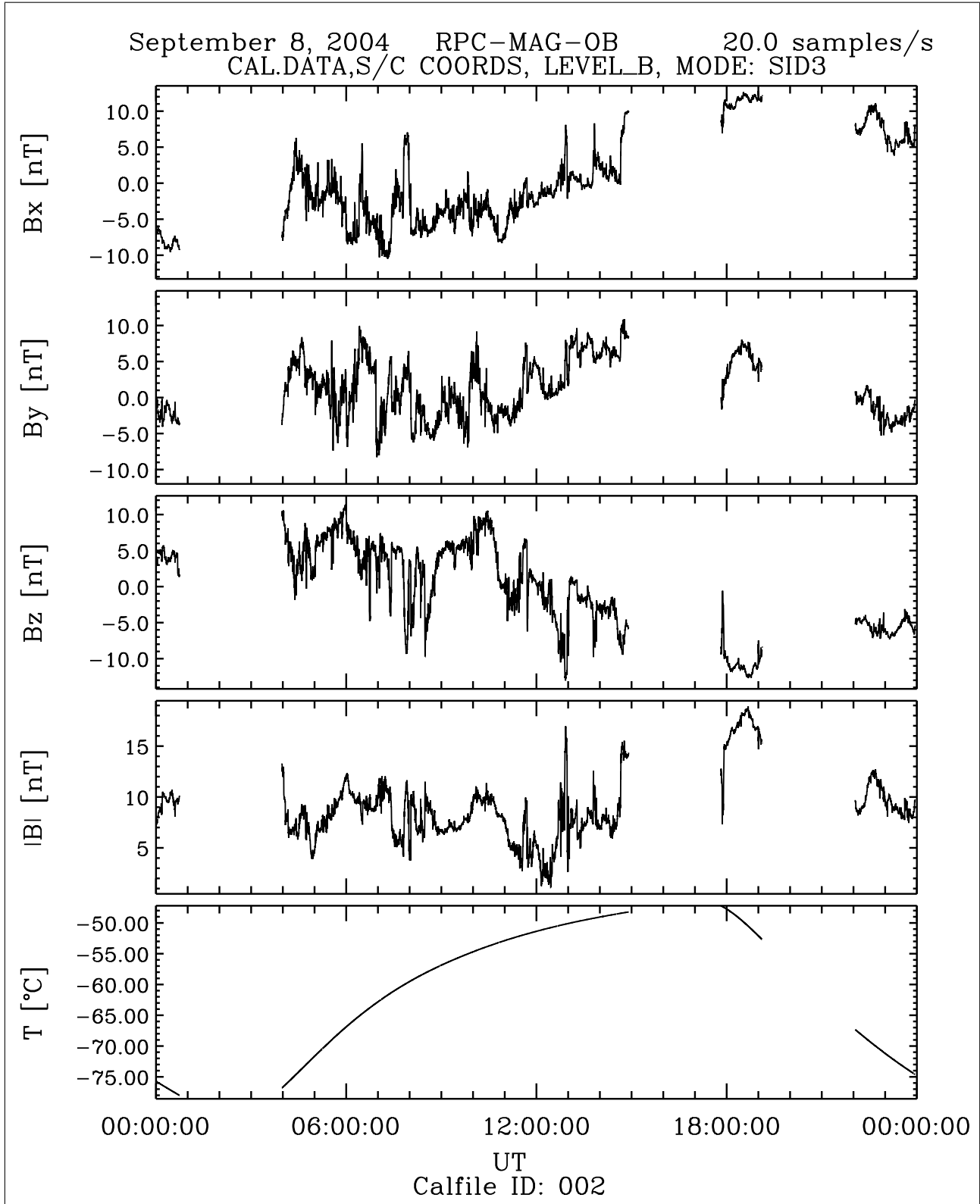


Figure 32: File: RPCMAG040908T0000\_CLB\_OB\_M3\_T0000\_2400\_002



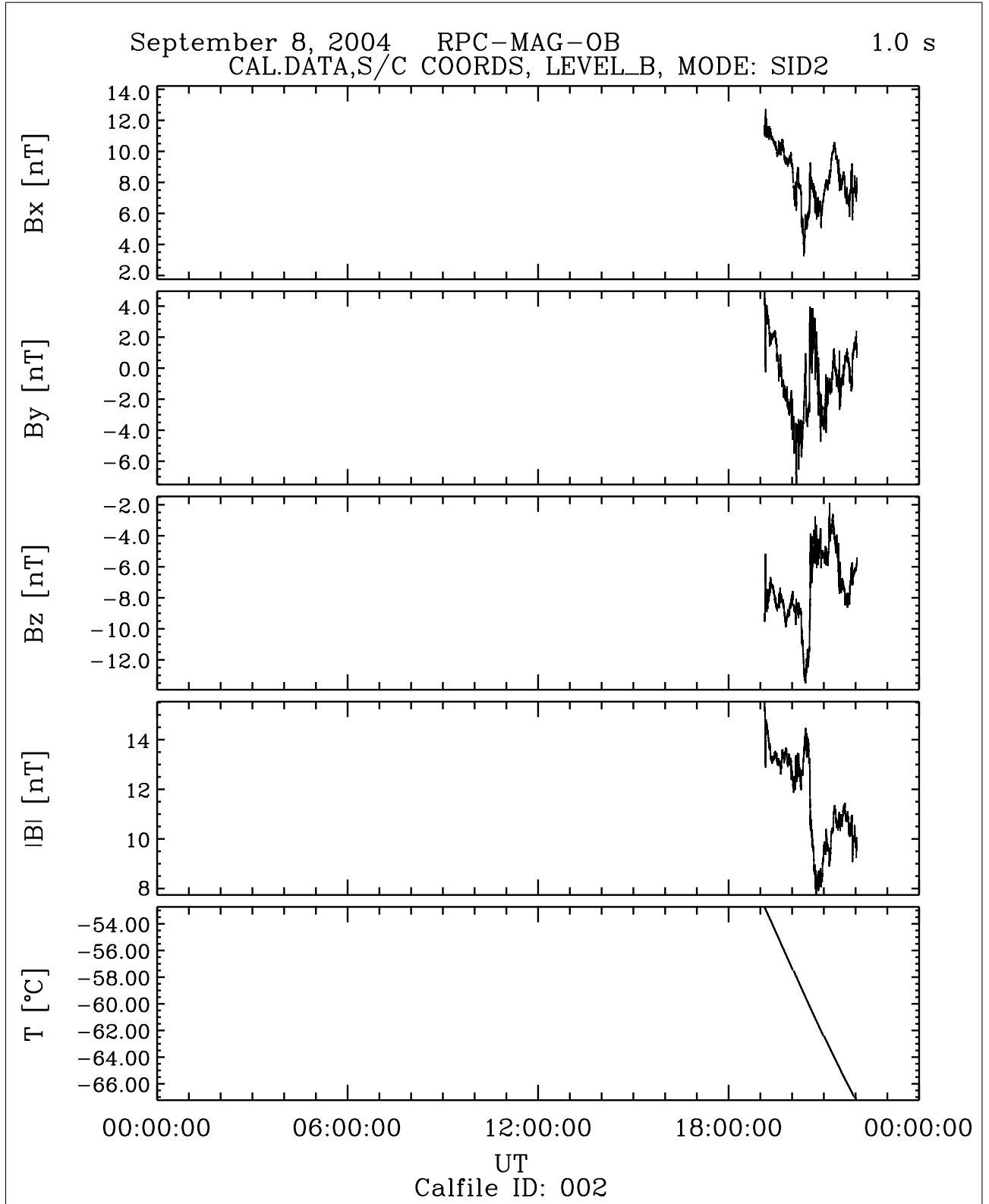


Figure 33: File: RPCMAG040908T1907\_CLB\_OB\_M2\_T0000\_2400\_002

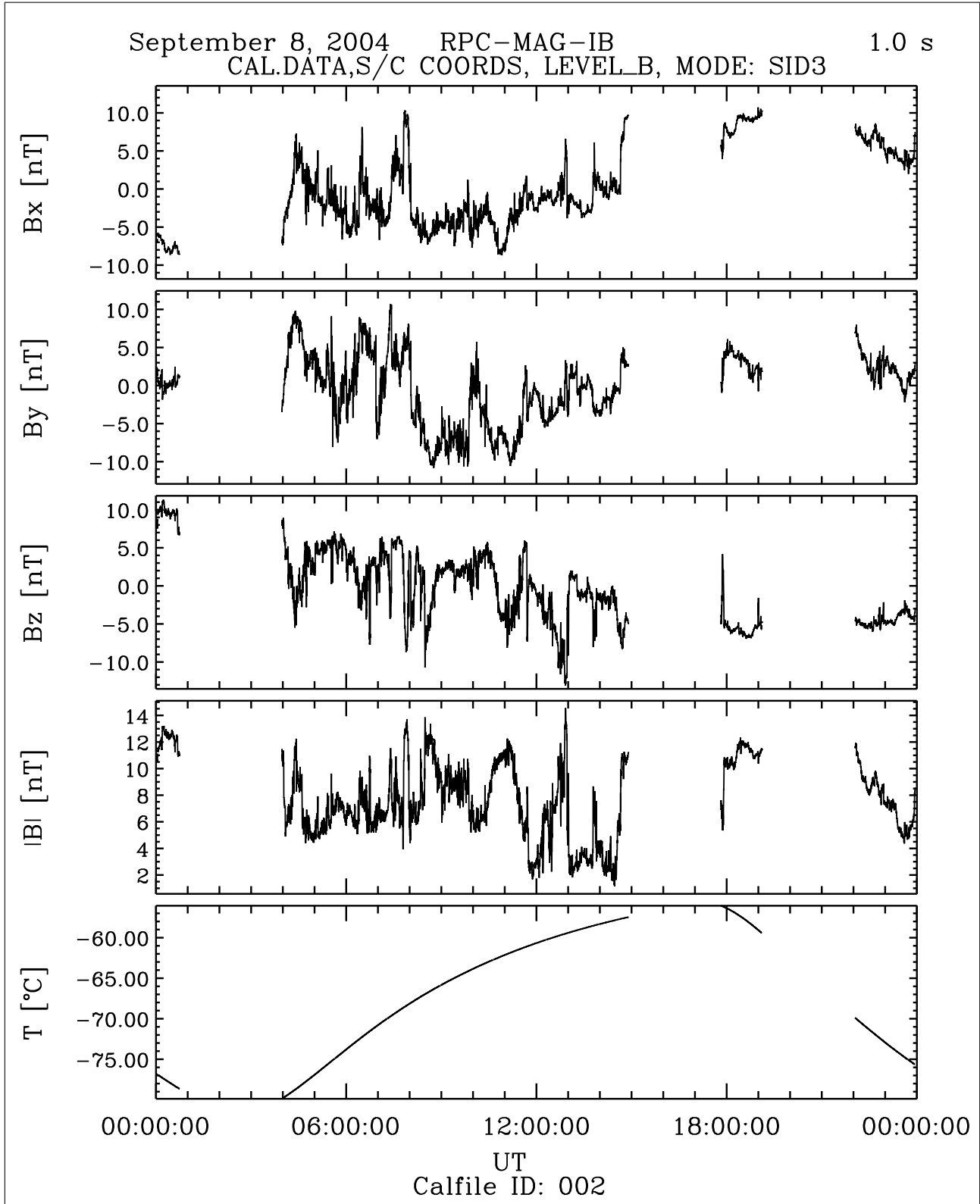


Figure 34: File: RPCMAG040908T0000\_CLB\_IB\_M3\_T0000\_2400\_002

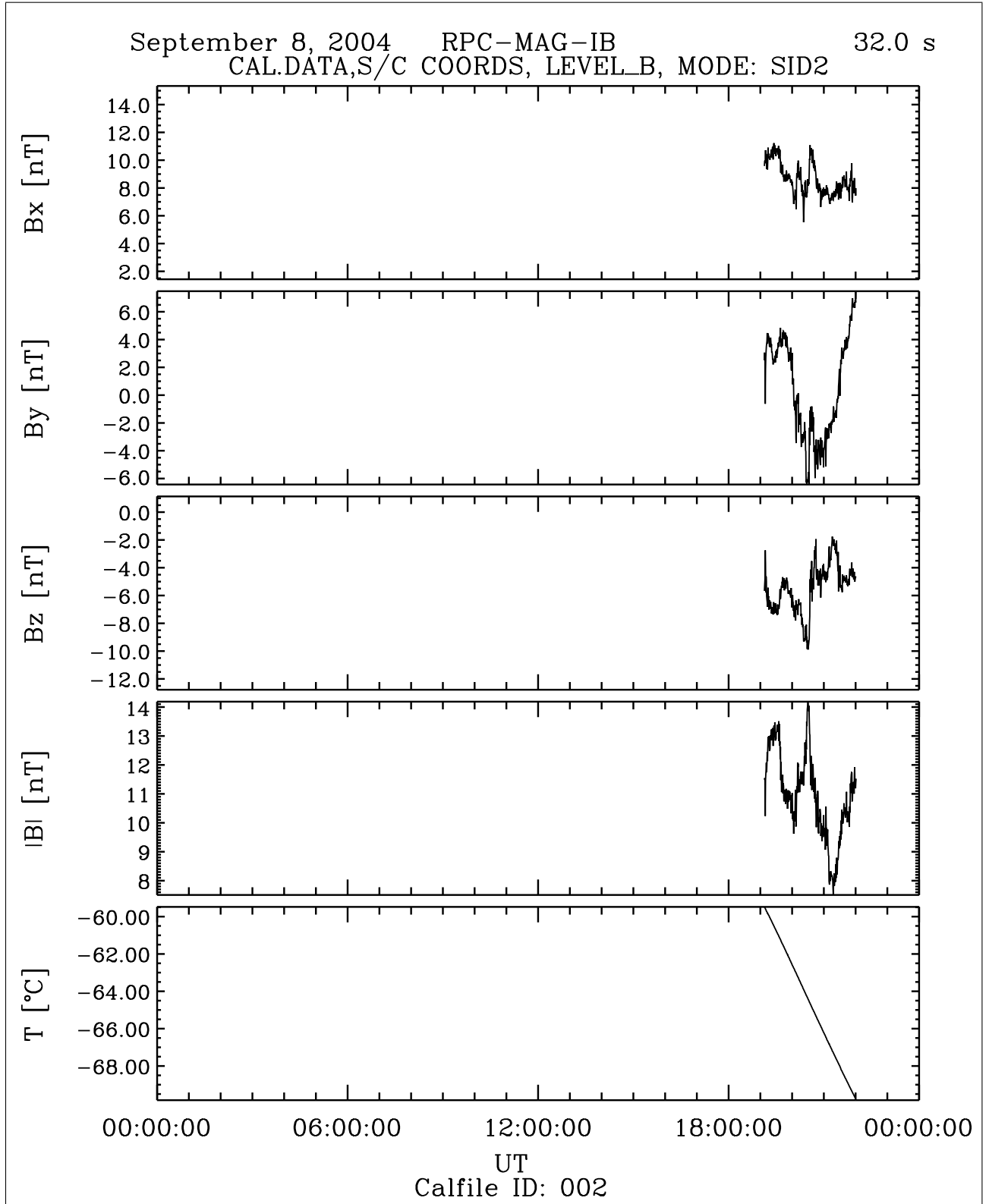


Figure 35: File: RPCMAG040908T1907\_CLB\_IB\_M2\_T0000\_2400\_002

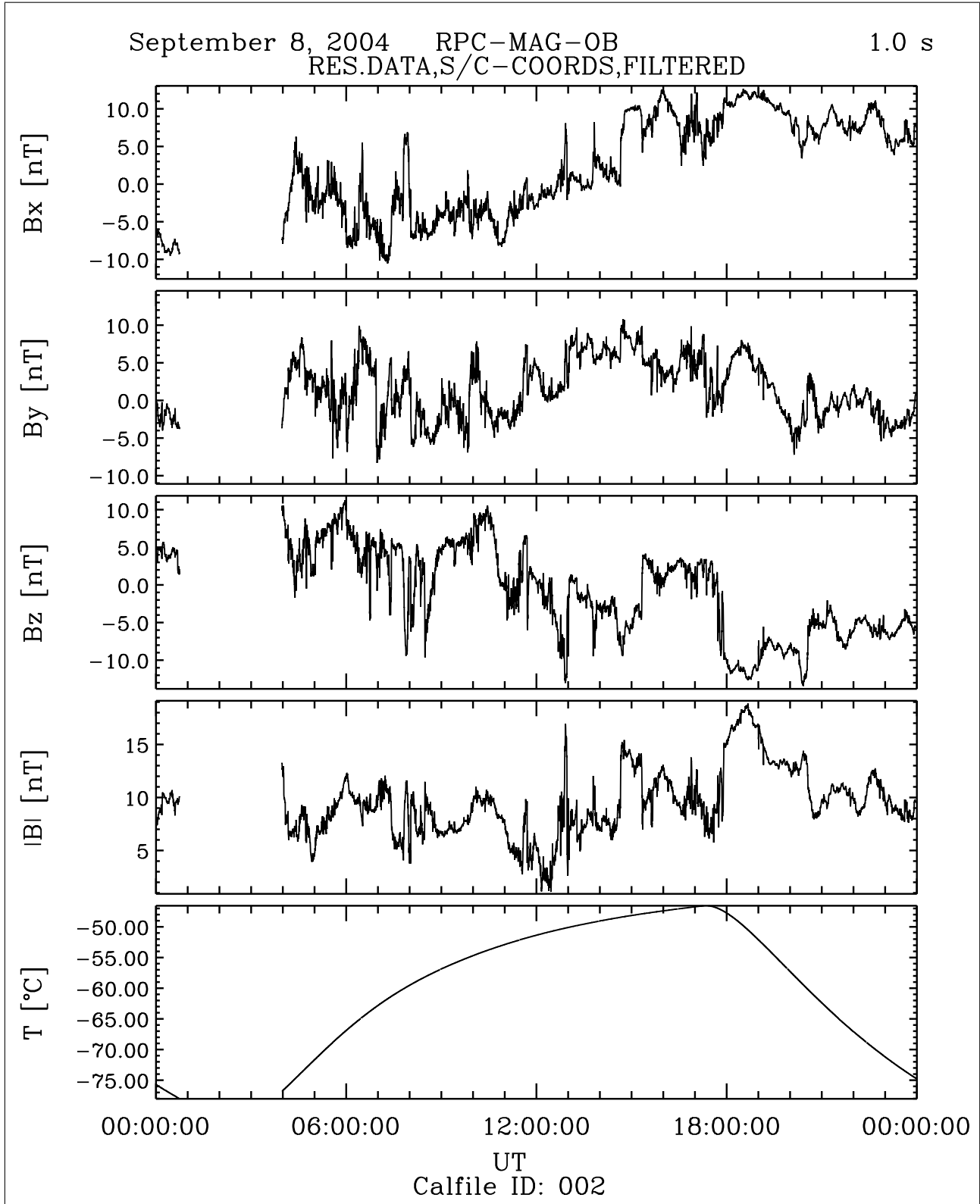


Figure 36: File: RPCMAG040908\_CLF\_OB\_A1\_T0000\_2400\_002

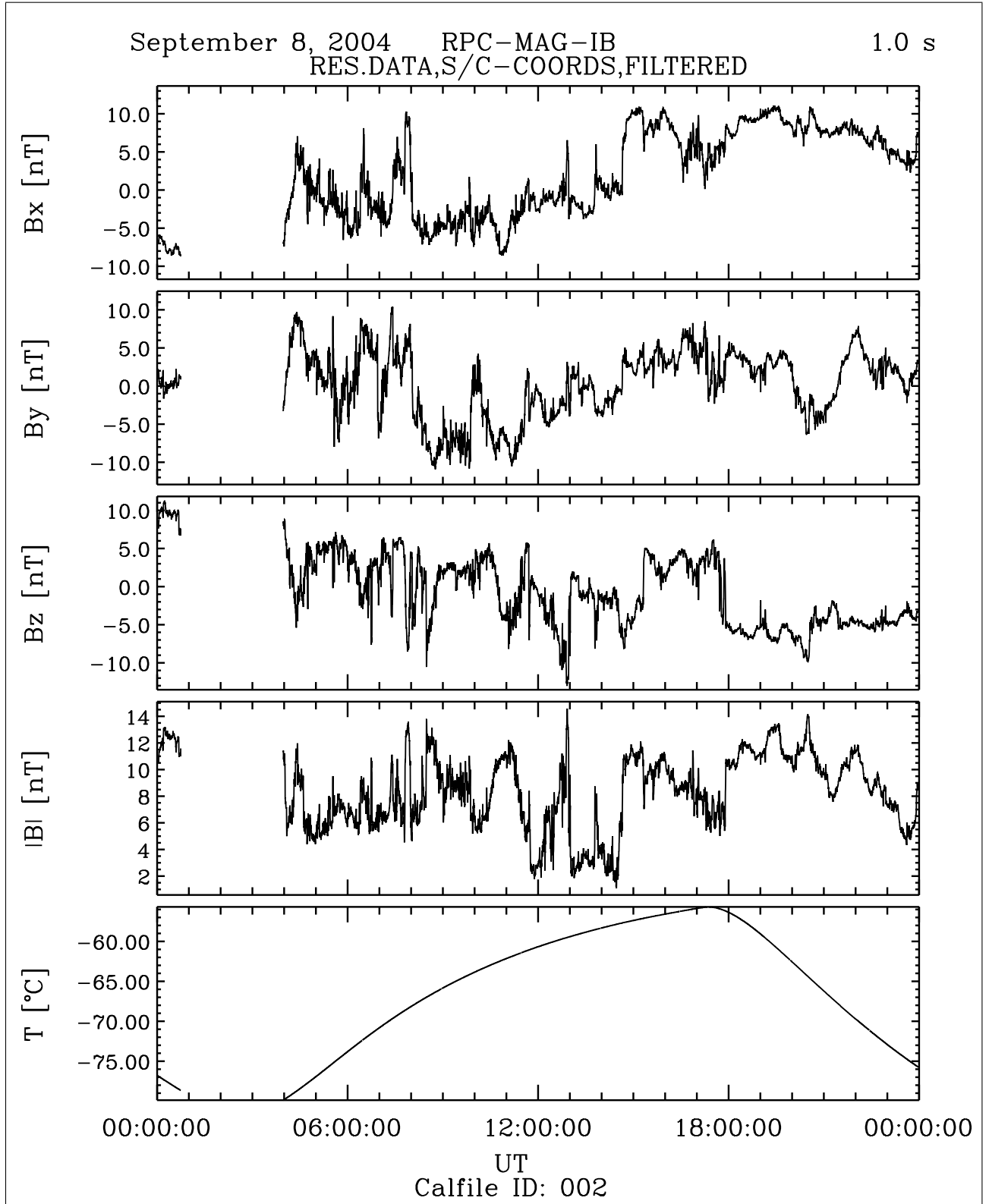


Figure 37: File: RPCMAG040908\_CLF\_IB\_A1\_T0000\_2400\_002

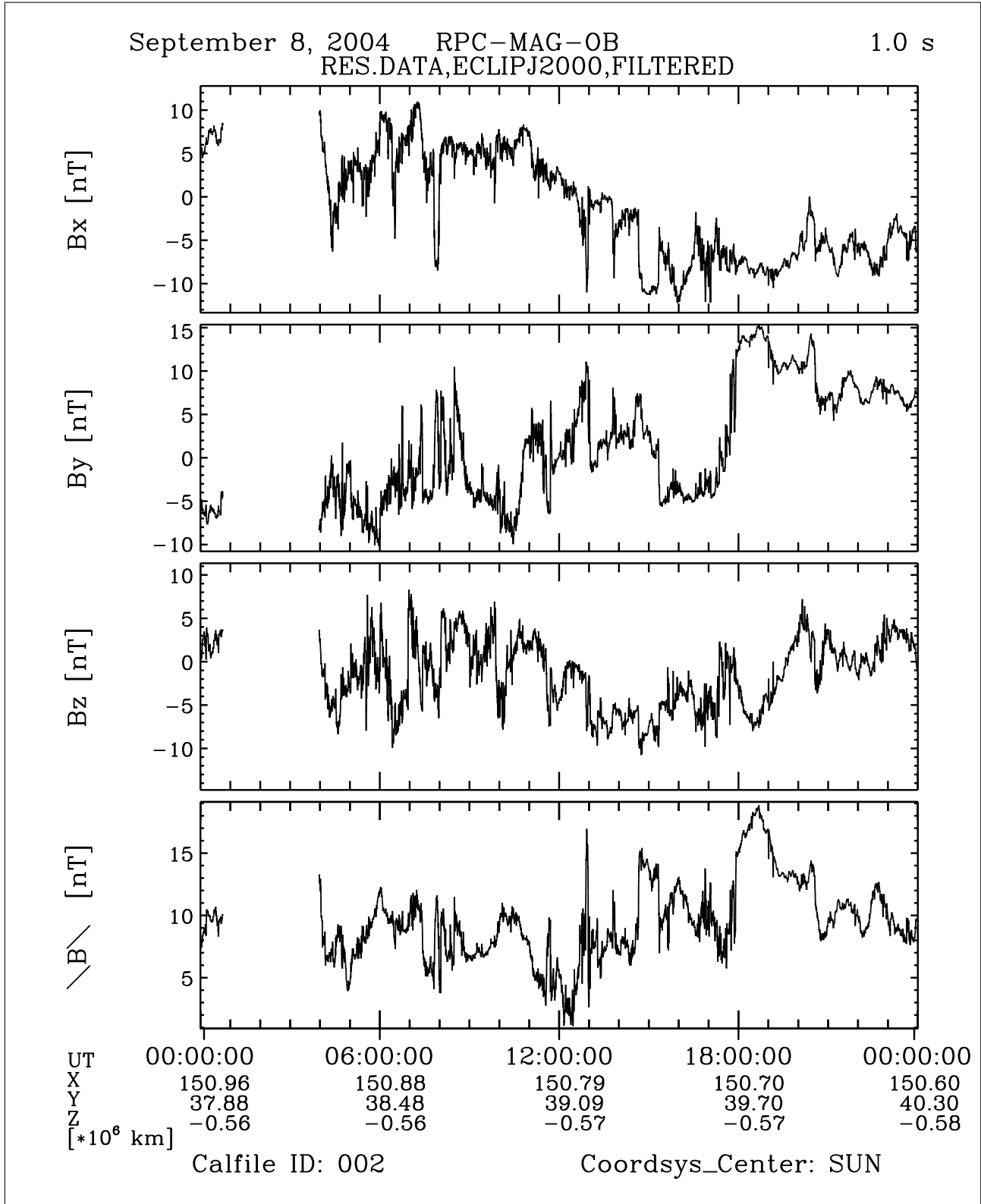


Figure 38: File: RPCMAG040908\_CLG\_OB\_A1.T0000\_2400\_002

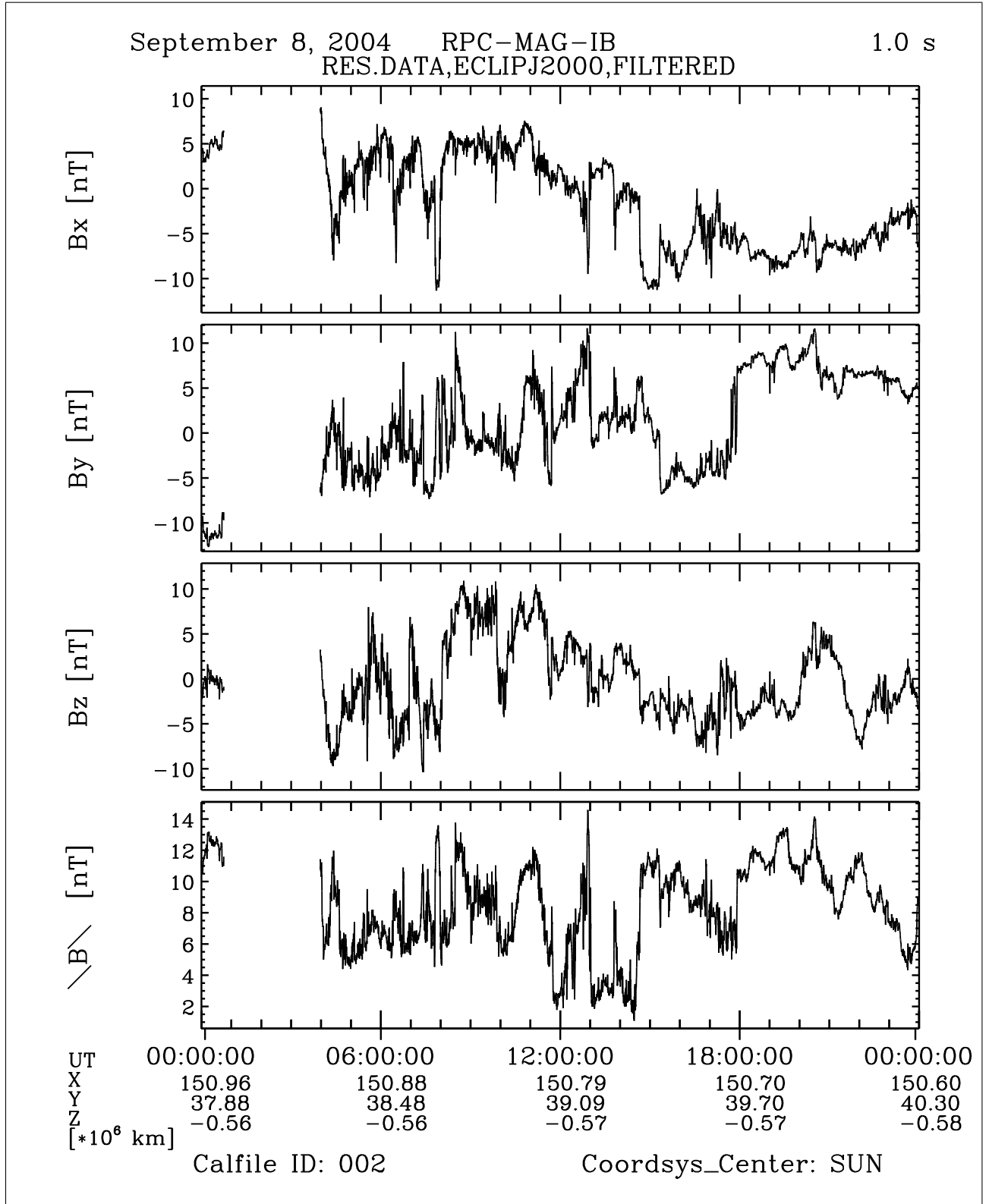


Figure 39: File: RPCMAG040908\_CLG\_IB\_A1\_T0000\_2400\_002

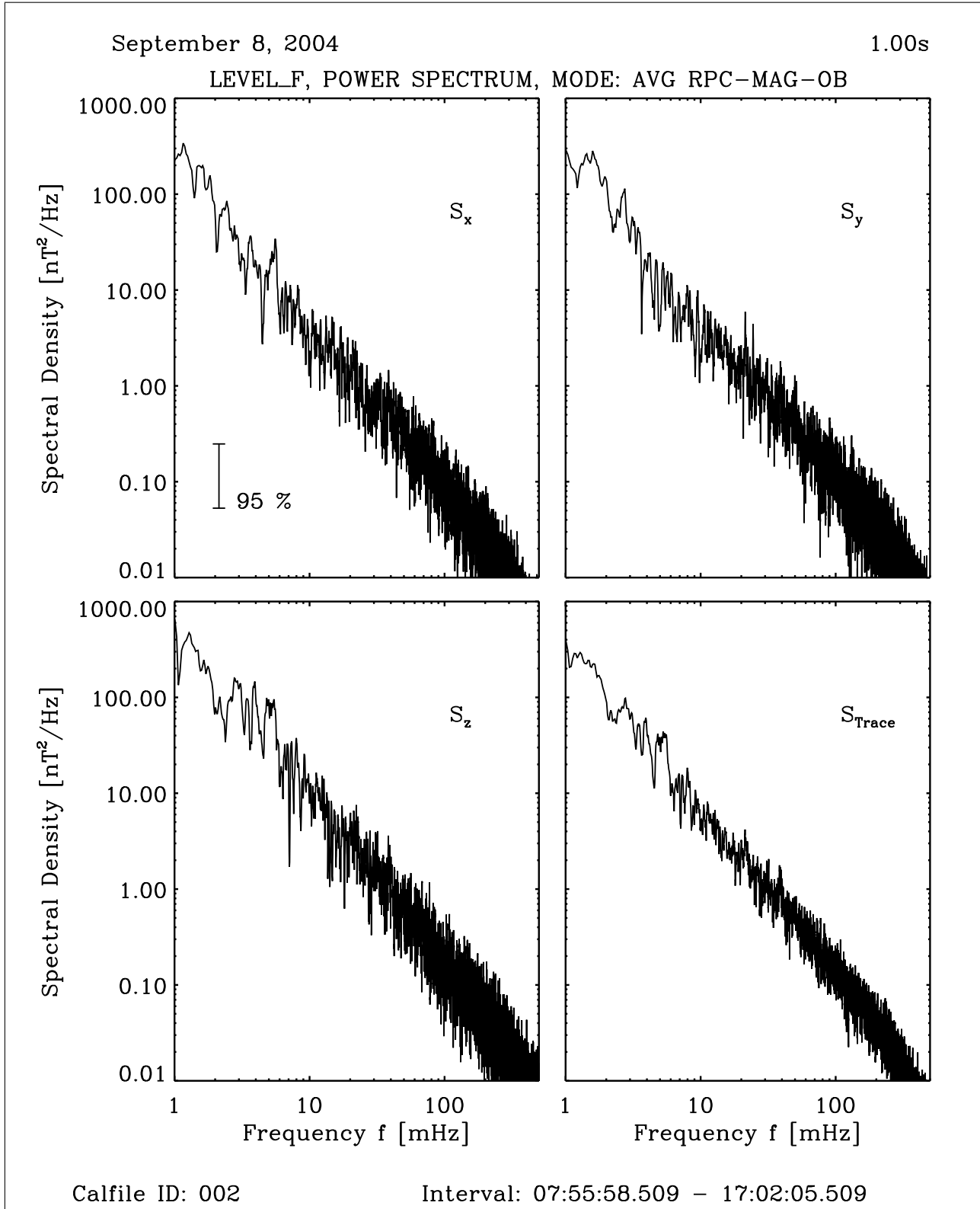


Figure 40: File: RPCMAG040908\_CLF\_OB\_A1\_PS1\_500\_002



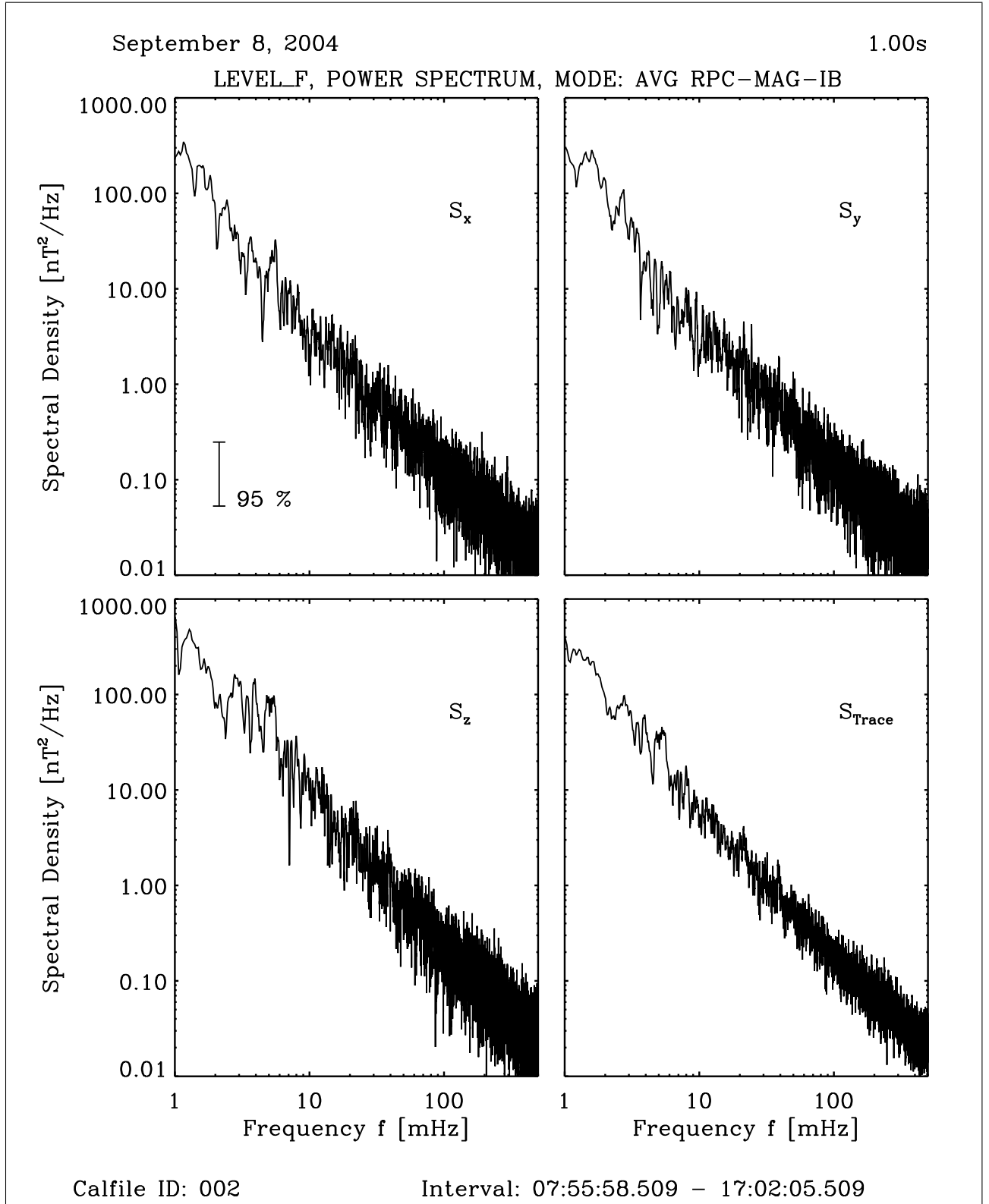


Figure 41: File: RPCMAG040908\_CLF\_IB\_A1\_PS1\_500\_002

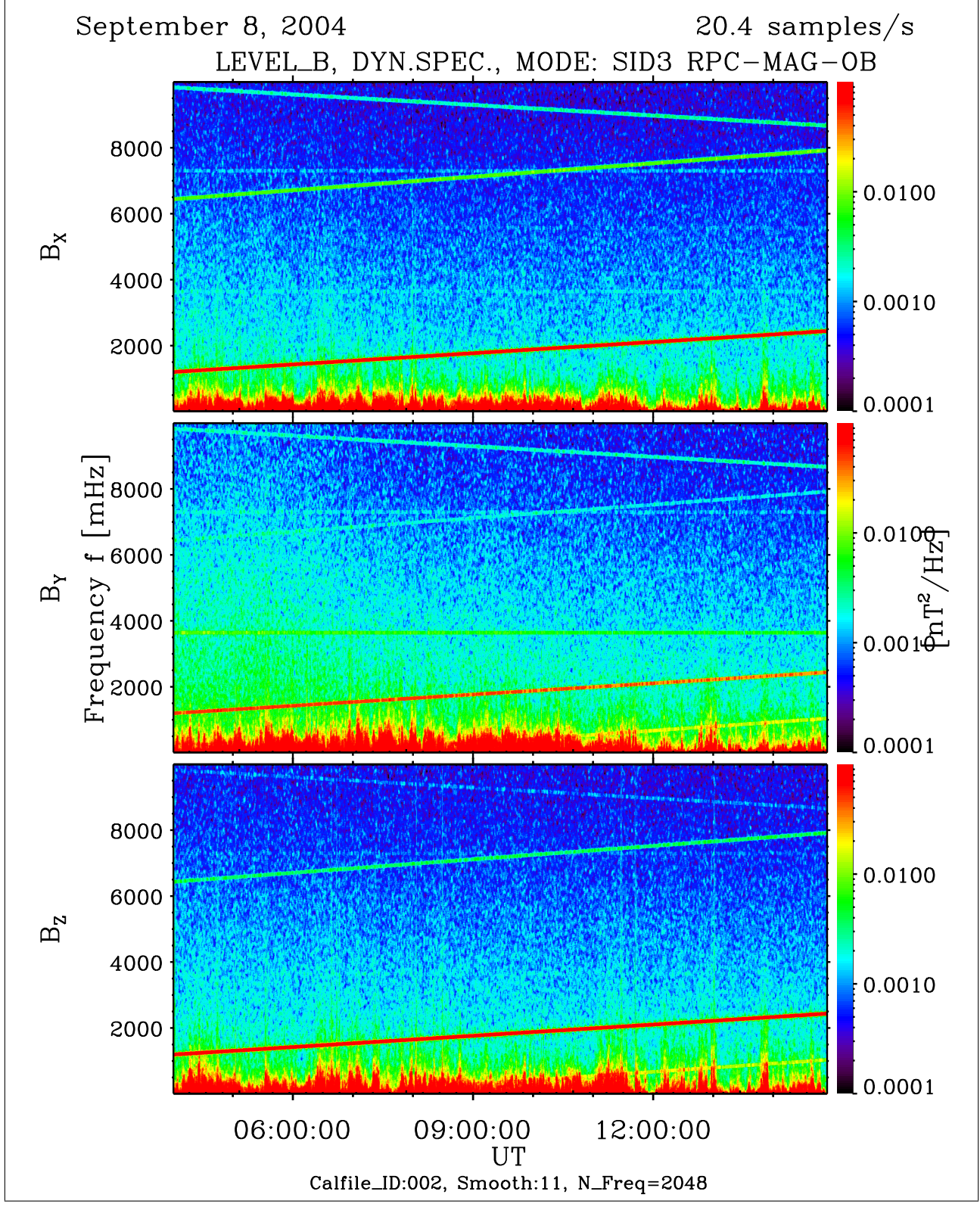


Figure 42: File: RPCMAG040908T0000\_CLB\_OB\_M3\_DS0\_10000\_002

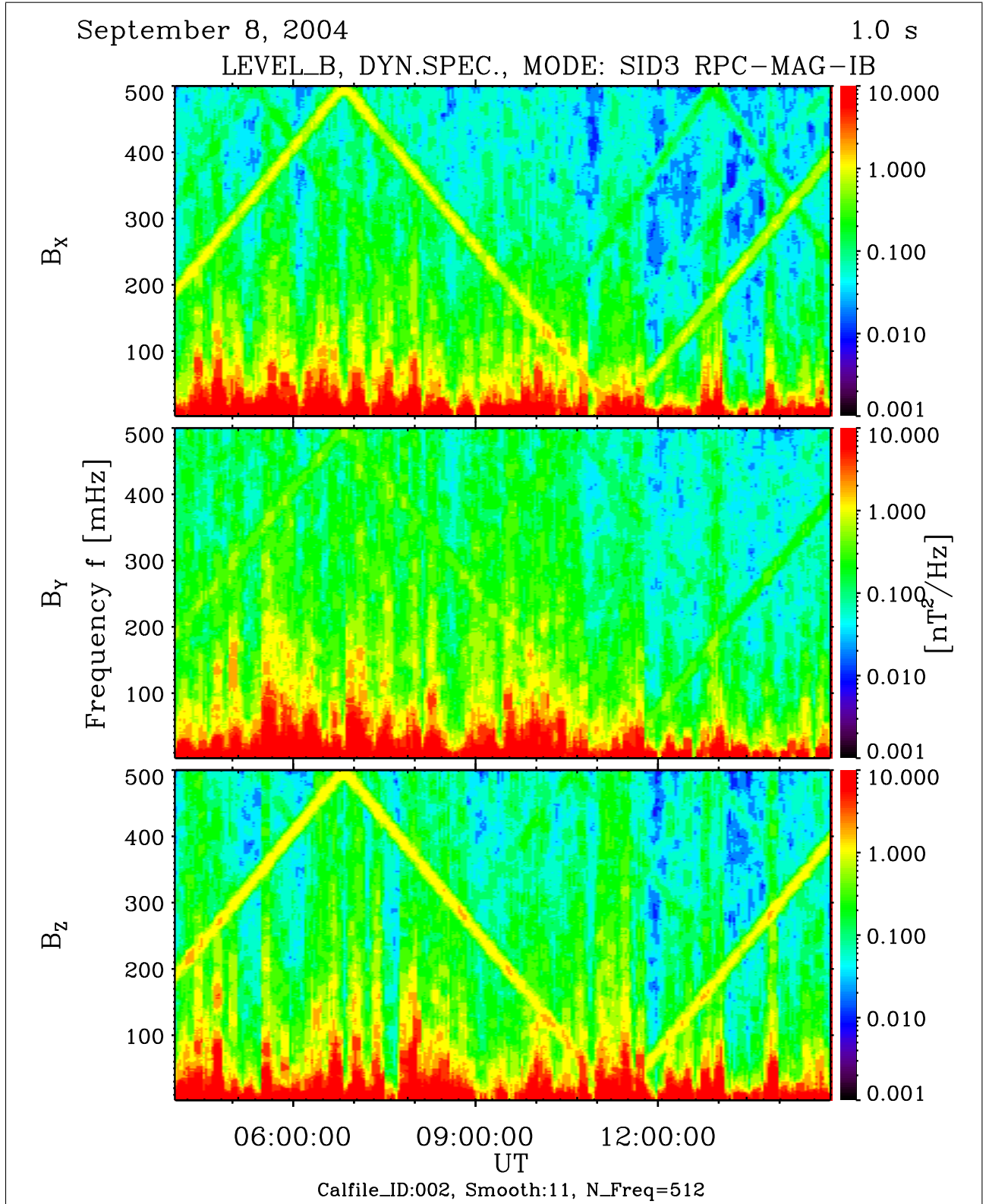


Figure 43: File: RPCMAG040908T0000\_CLB\_IB\_M3\_DS0\_10000\_002

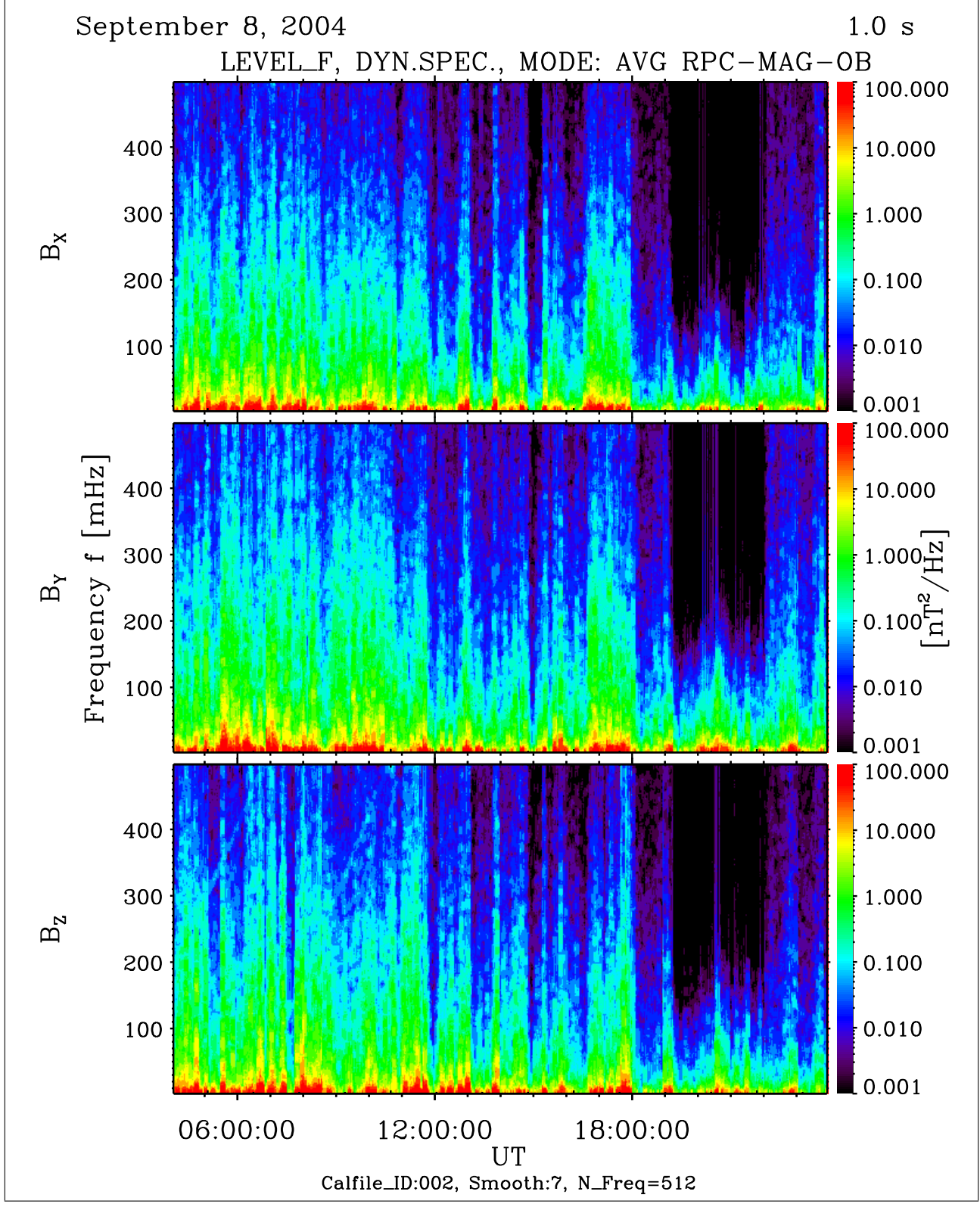


Figure 44: File: RPCMAG040908\_CLF\_OB\_A1\_DS0\_500\_002

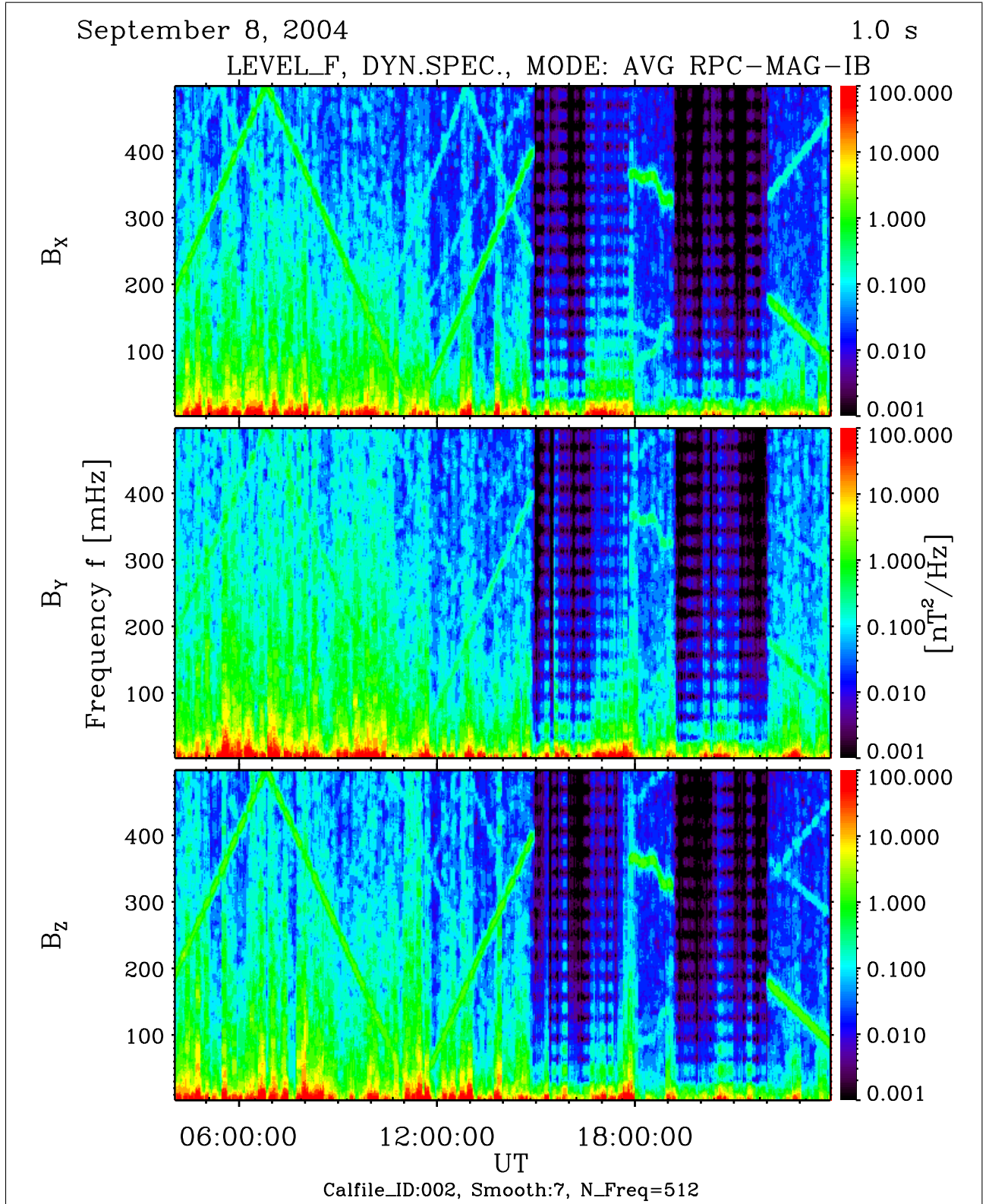


Figure 45: File: RPCMAG040908\_CLF\_IB\_A1\_DS0\_500\_002

<h1 style="margin: 0;">ROSETTA</h1>	Document: RO-IGEP-TR-0010 Issue: 3 Revision: 2
<h2 style="margin: 0;">IGEP</h2>	Institut für Geophysik u. extraterr. Physik Technische Universität Braunschweig Date: April 12, 2007 Page: 52

### 4.3 Plots of ROSETTA's Reaction Wheels Speeds

The following plots show the time series of the revolutions of the 4 reaction wheels. Two kinds of data are shown:

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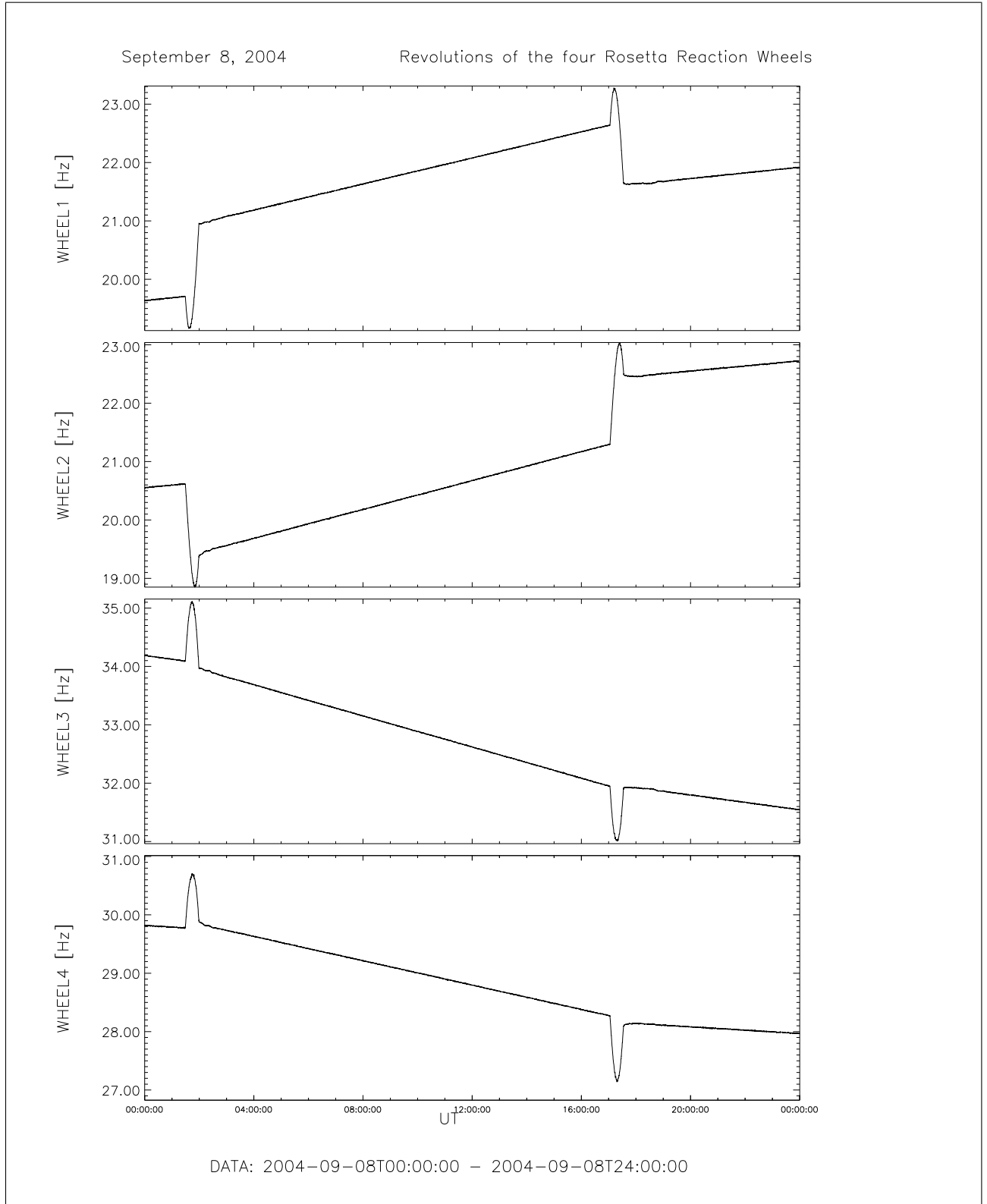


Figure 46: File: wheels\_Hz2004-09-08T00-00

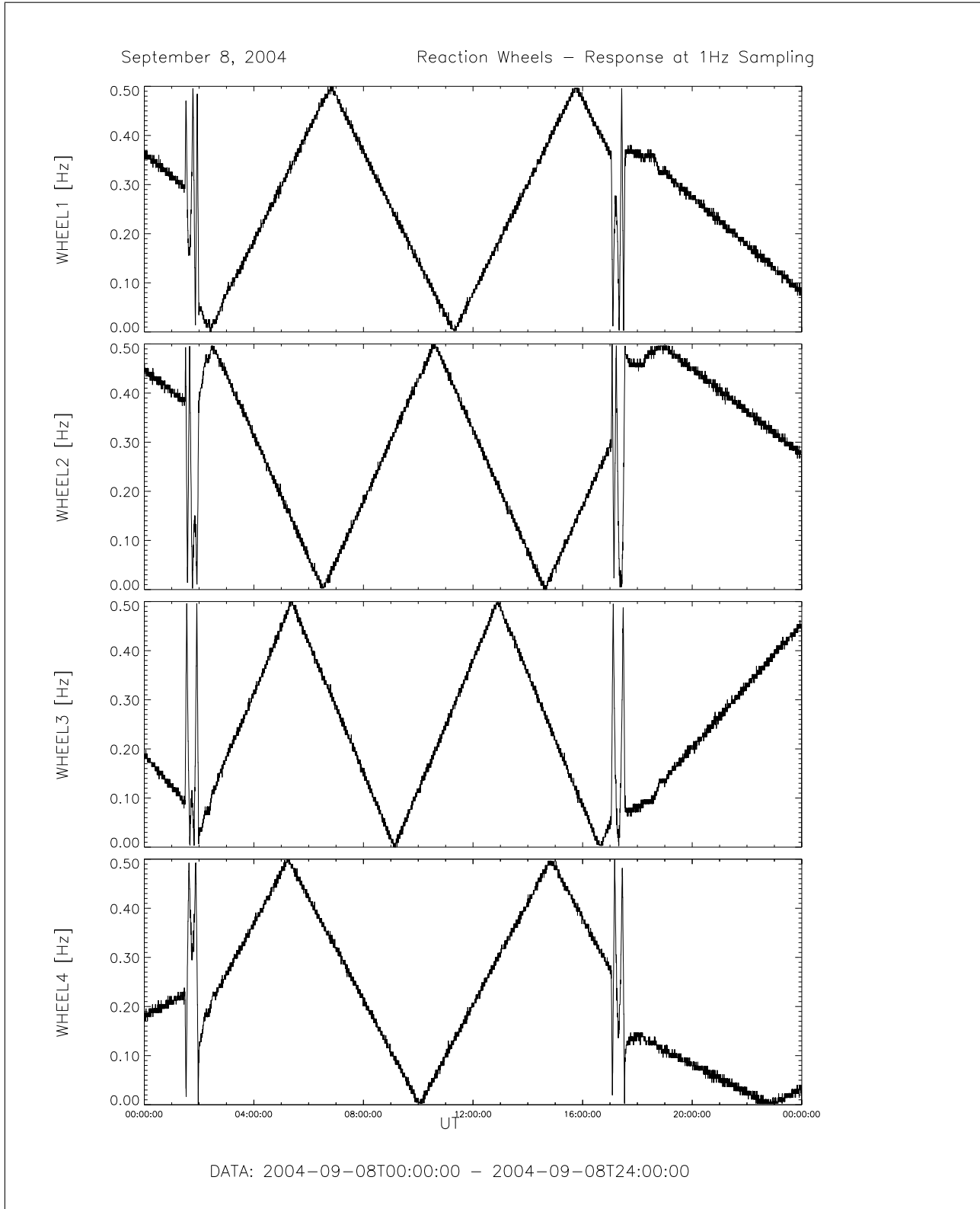


Figure 47: File: wheels\_1Hz\_Sampling2004-09-08T00-00



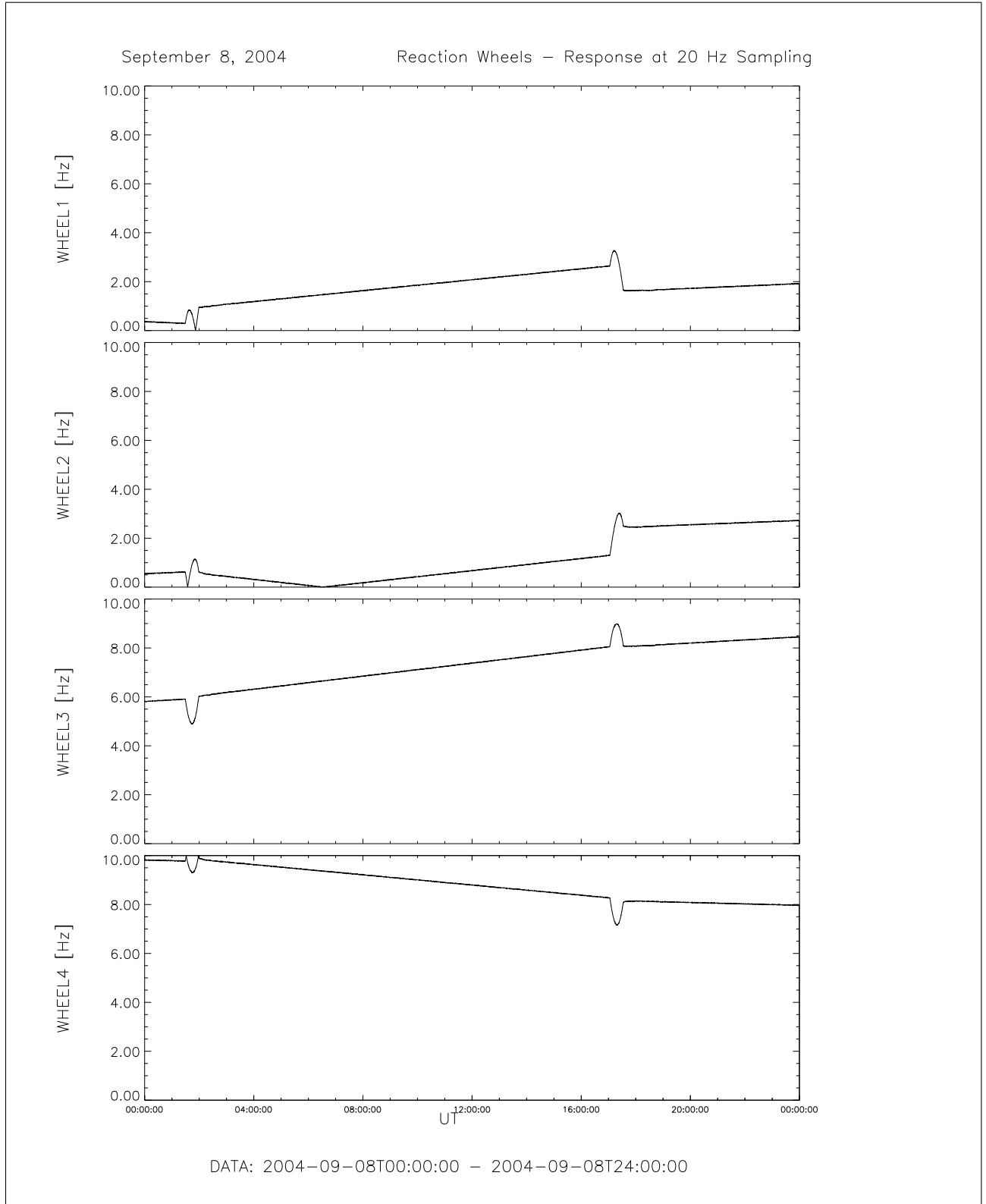


Figure 48: File: wheels\_20Hz\_Sampling2004-09-08T00-00

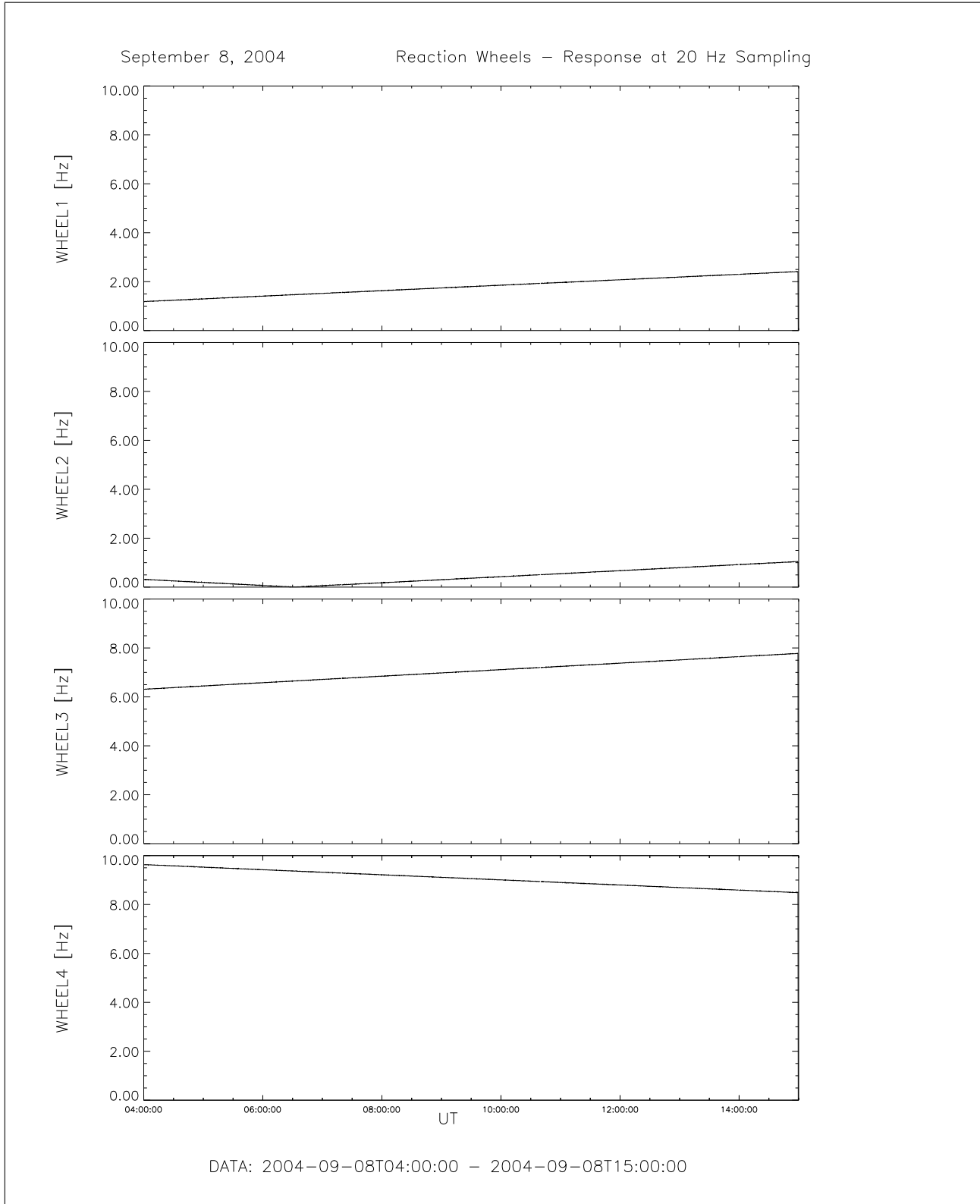


Figure 49: File: wheels\_20Hz\_Sampling2004-09-08T04-00

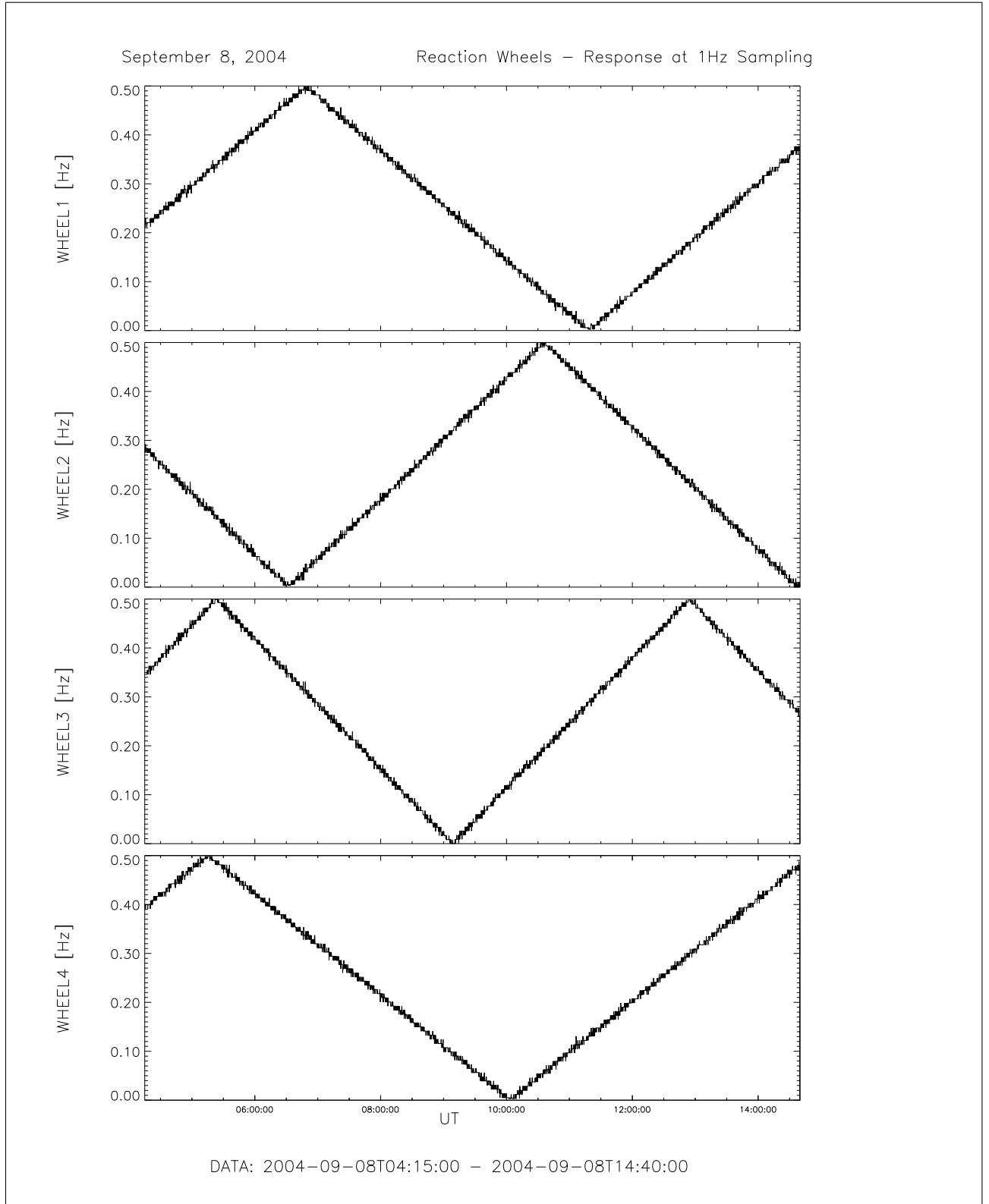


Figure 50: File: wheels\_1Hz\_Sampling2004-09-08T04-15

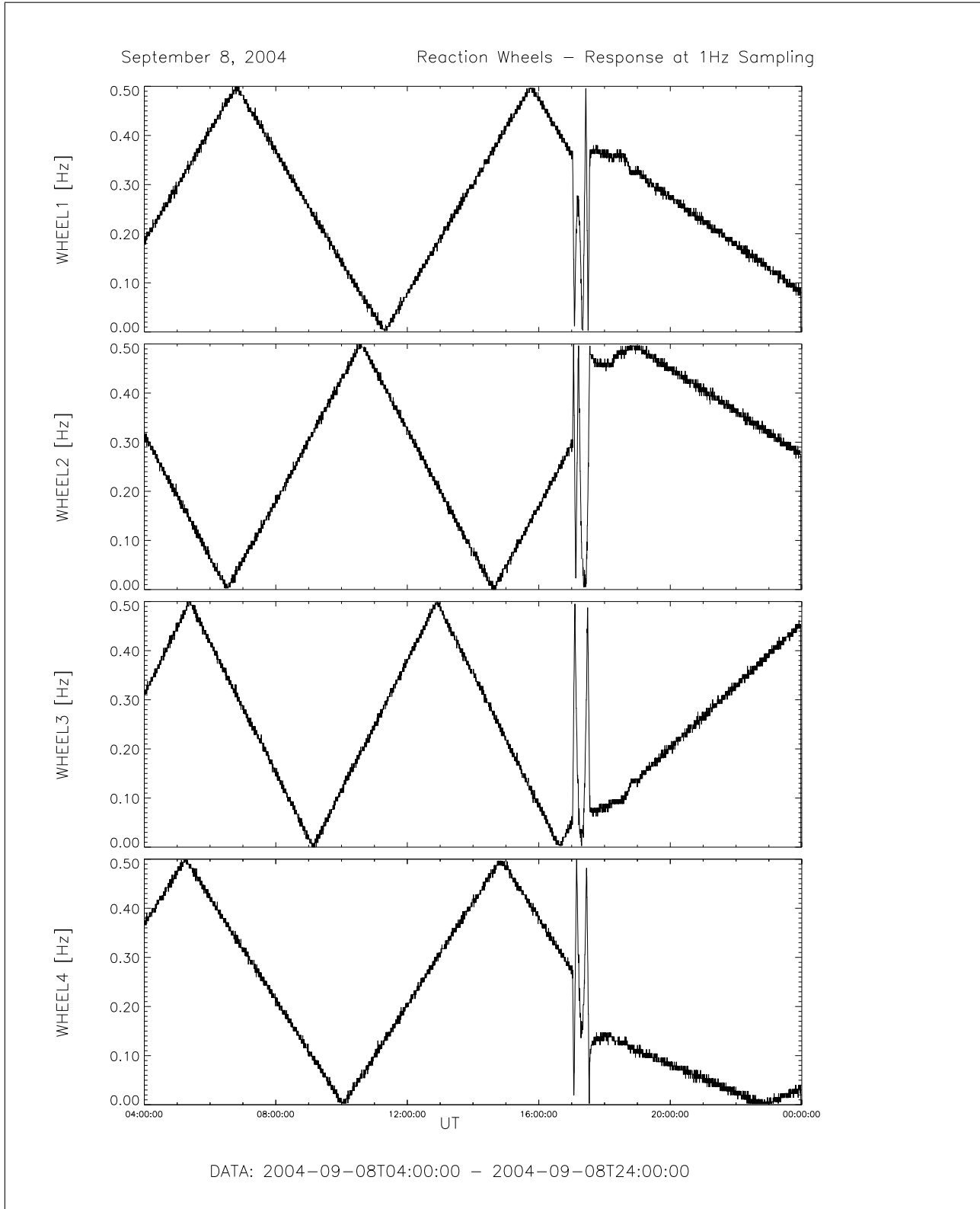


Figure 51: File: wheels\_1Hz\_Sampling2004-09-08T04-00

R O S E T T A	Document: RO-IGEP-TR-0010
	Issue: 3
	Revision: 2
IGEP Institut für Geophysik u. extraterr. Physik	Date: April 12,2007
Technische Universität Braunschweig	Page: 59

#### 4.4 Plots of ROMAP

REMARK:

The Temperature panel in the ROMAP Time series plots does not contain only dummy data.

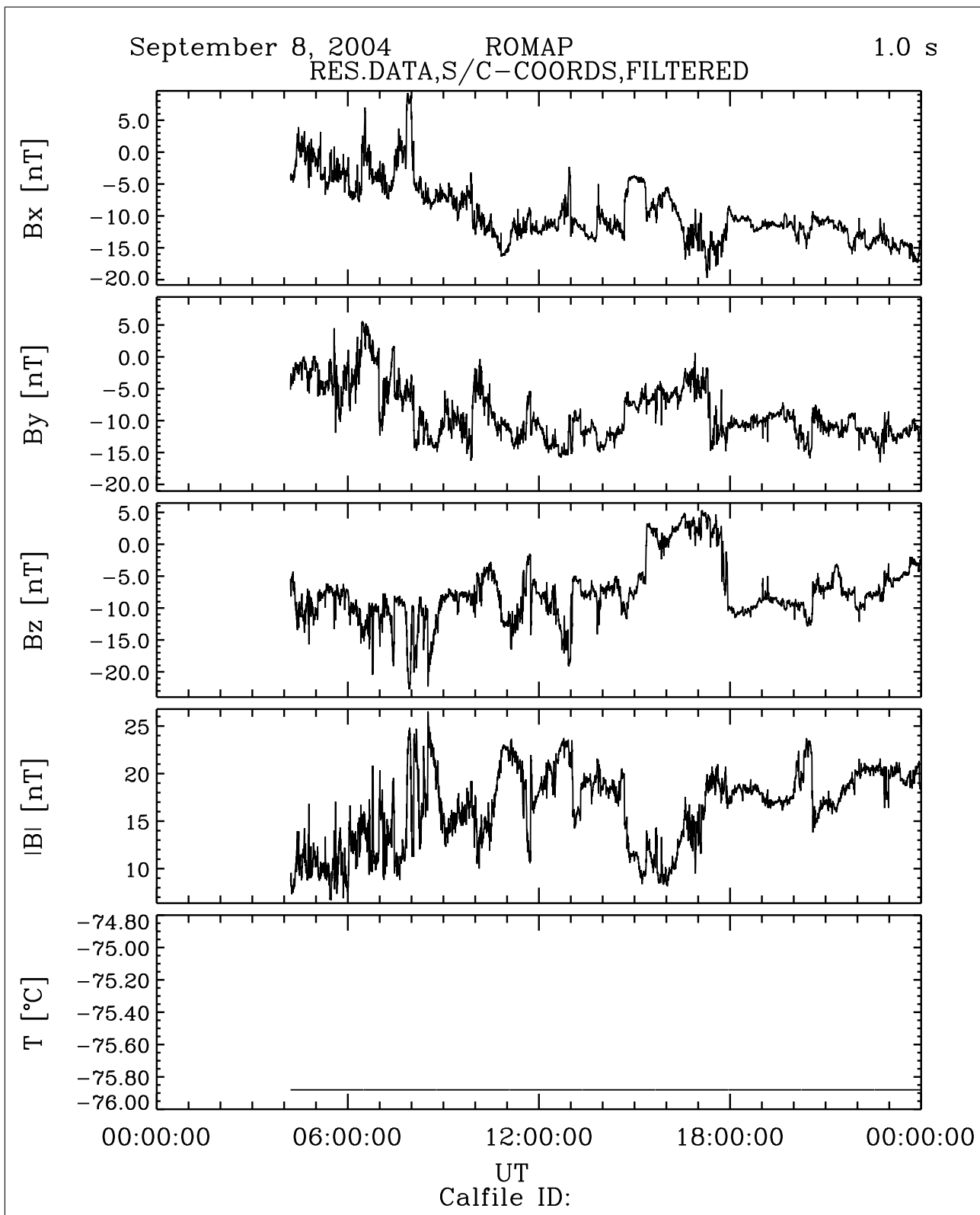


Figure 52: File: ROMAP040908\_CLF\_RO\_A1\_T0000\_2400\_UNK

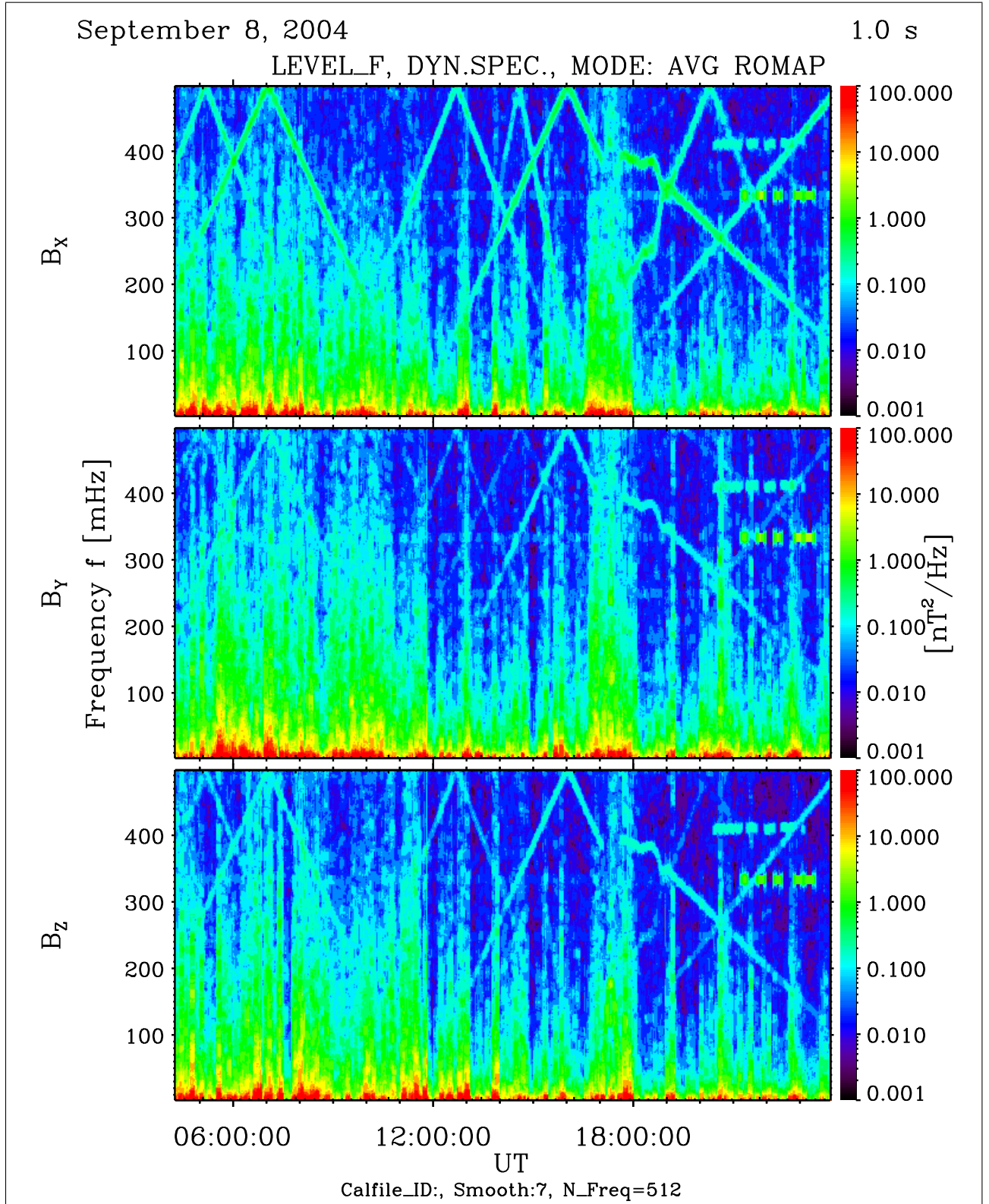


Figure 53: File: ROMAP040908\_CLF\_RO\_A1\_DS1\_500\_UNK

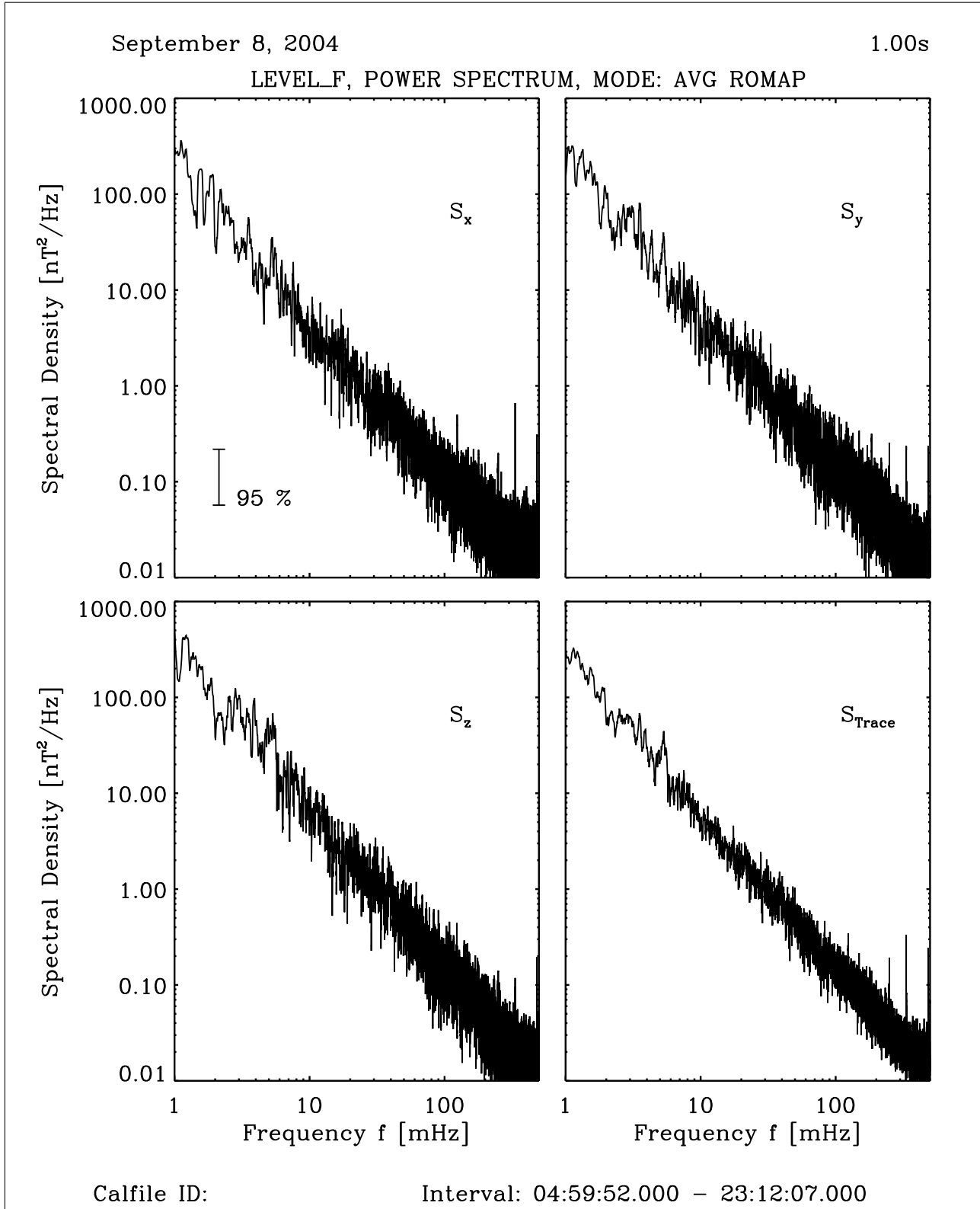


Figure 54: File: ROMAP040908\_CLF\_RO\_A1\_PS1\_500\_UNK



R O S E T T A		Document: RO-IGEP-TR-0010
		Issue: 3
		Revision: 2
IGEP	Institut für Geophysik u. extraterr. Physik	Date: April 12,2007
	Technische Universität Braunschweig	Page: 63

## 5 September 09, 2004:

### 5.1 Actions

Time	Stage A, Stage B, Filter cfg	Stage 1, Stage 2, Stage3	Mode
00:00 – 09:37	2 0 0	2 0 0	SID4
09:38 – 23:59	0 0 0	0 0 0	SID3

### 5.2 Plots of Calibrated Data using the new Temperature Model

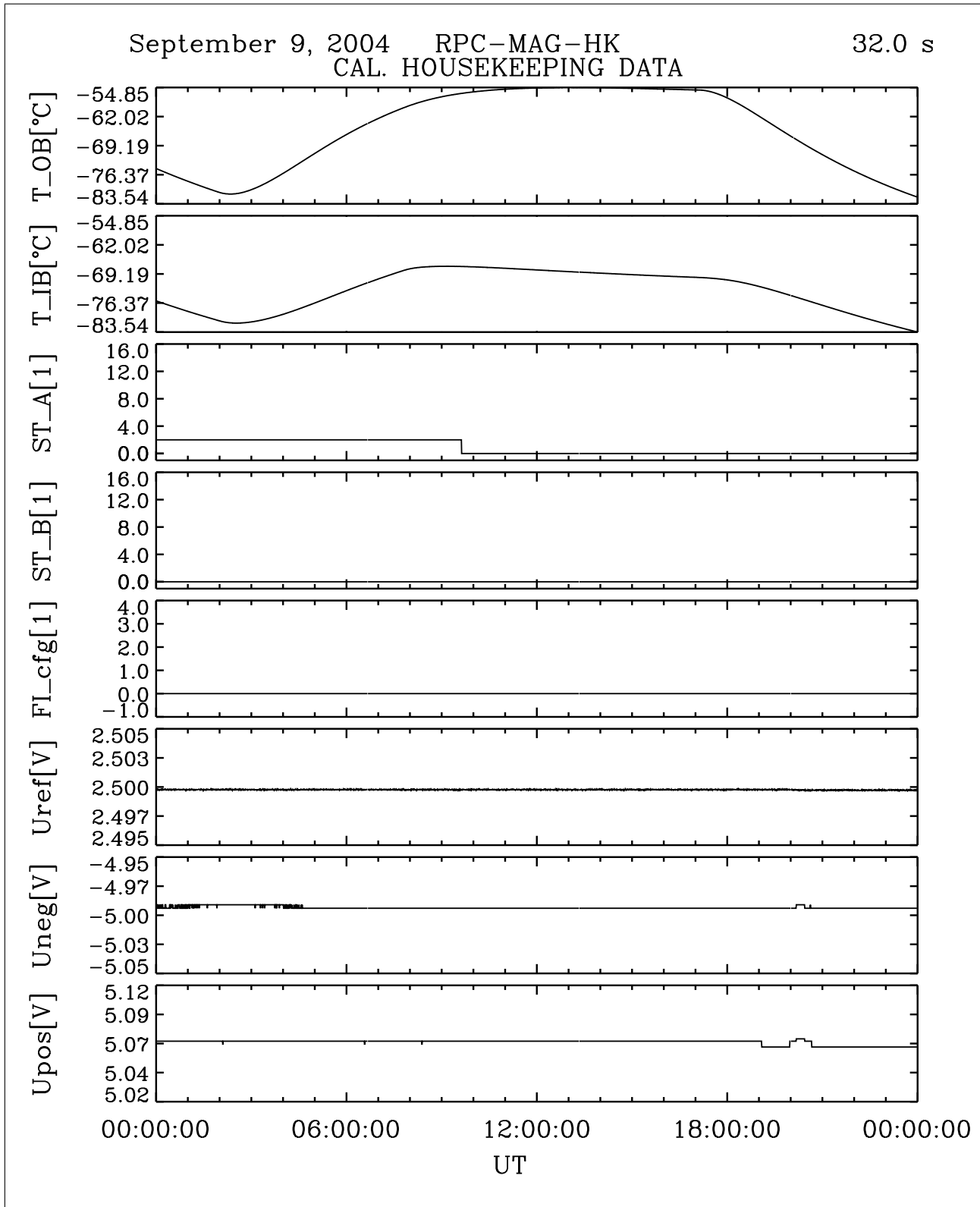


Figure 55: File: RPCMAG040909T0000\_CLA\_HK\_P0000\_2400

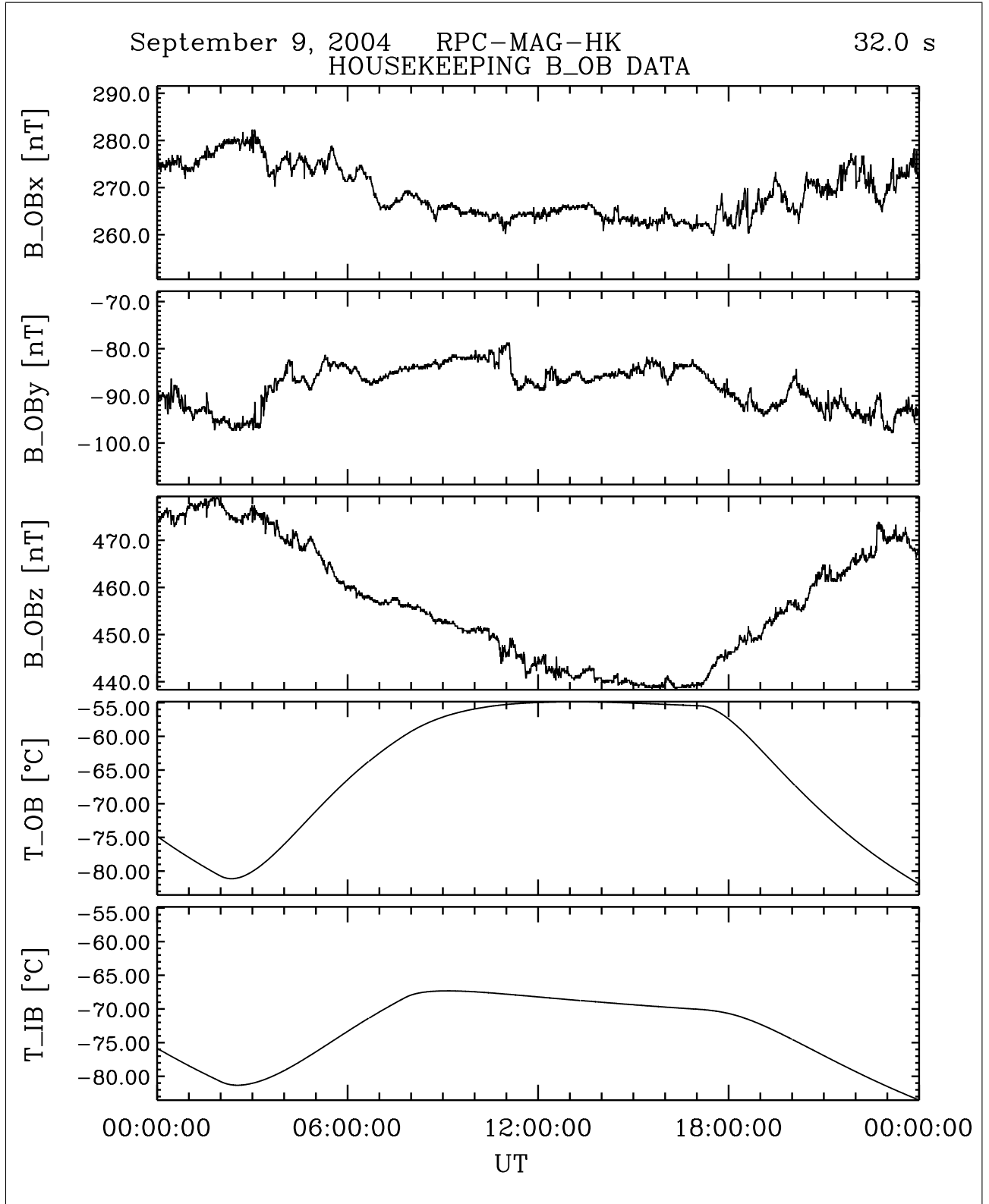


Figure 56: File: RPCMAG040909T0000\_CLA\_HK\_B\_P0000\_2400

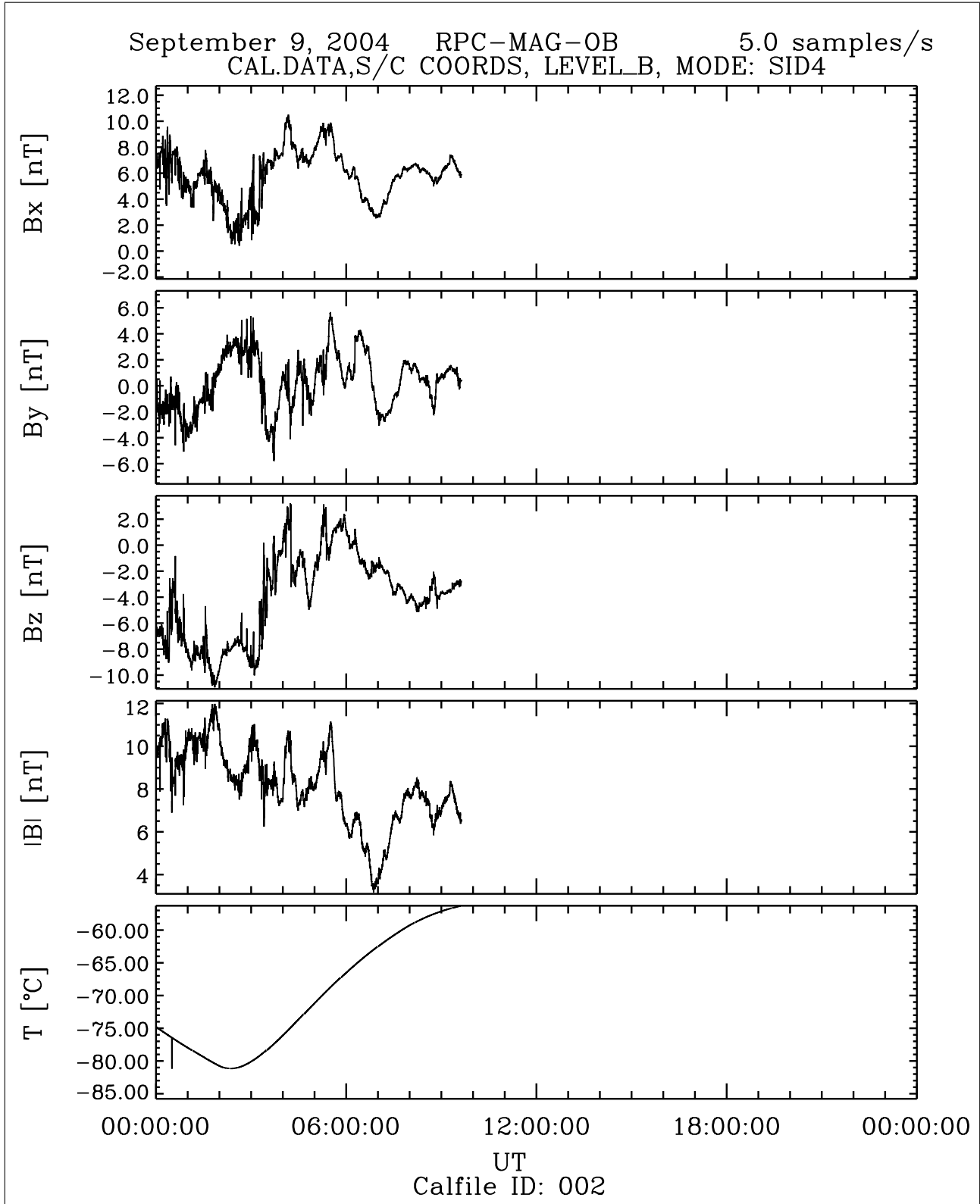


Figure 57: File: RPCMAG040909T0000\_CLB\_OB\_M4\_T0000\_2400\_002

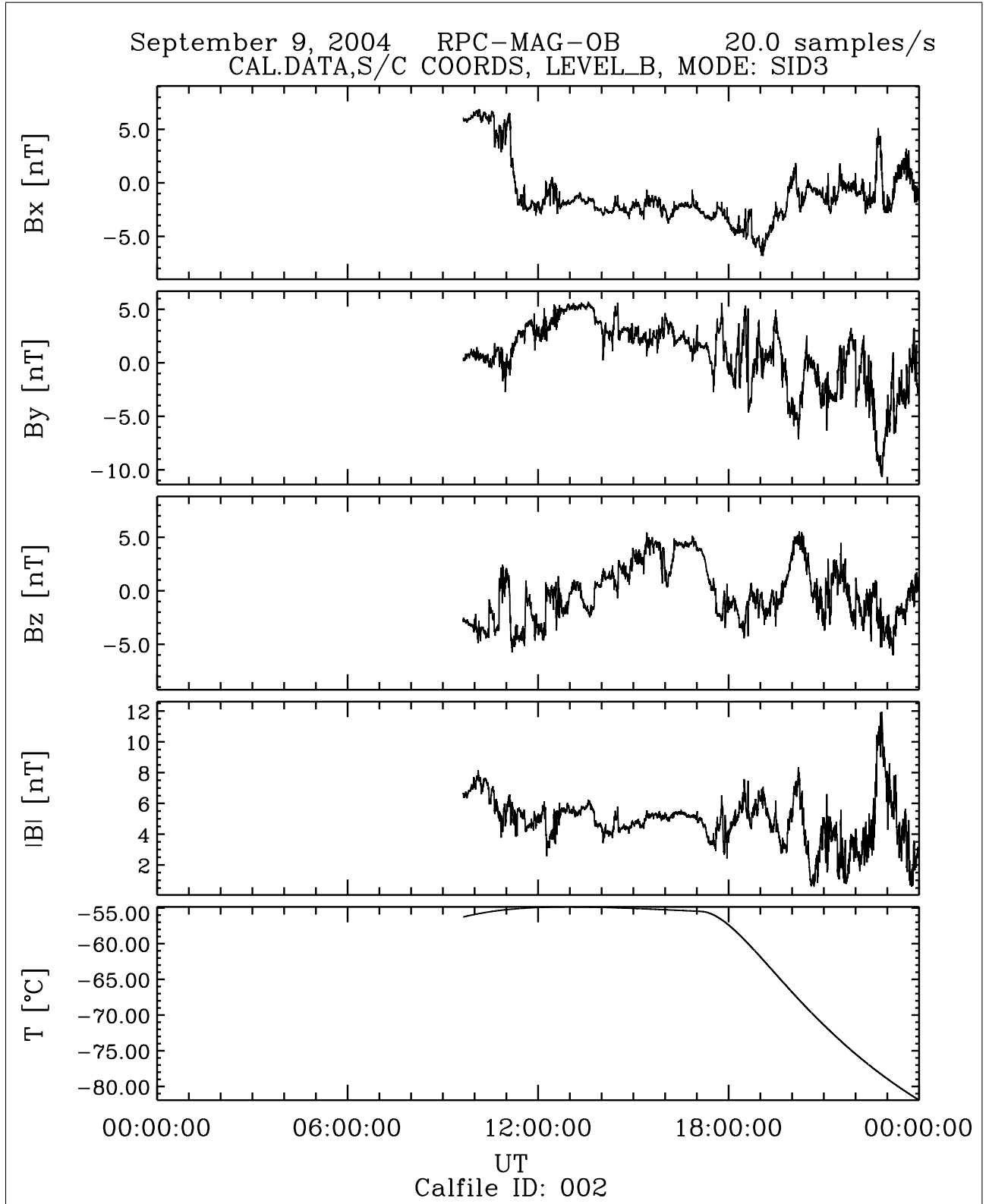


Figure 58: File: RPCMAG040909T0938\_CLB\_OB\_M3\_T0000\_2400\_002

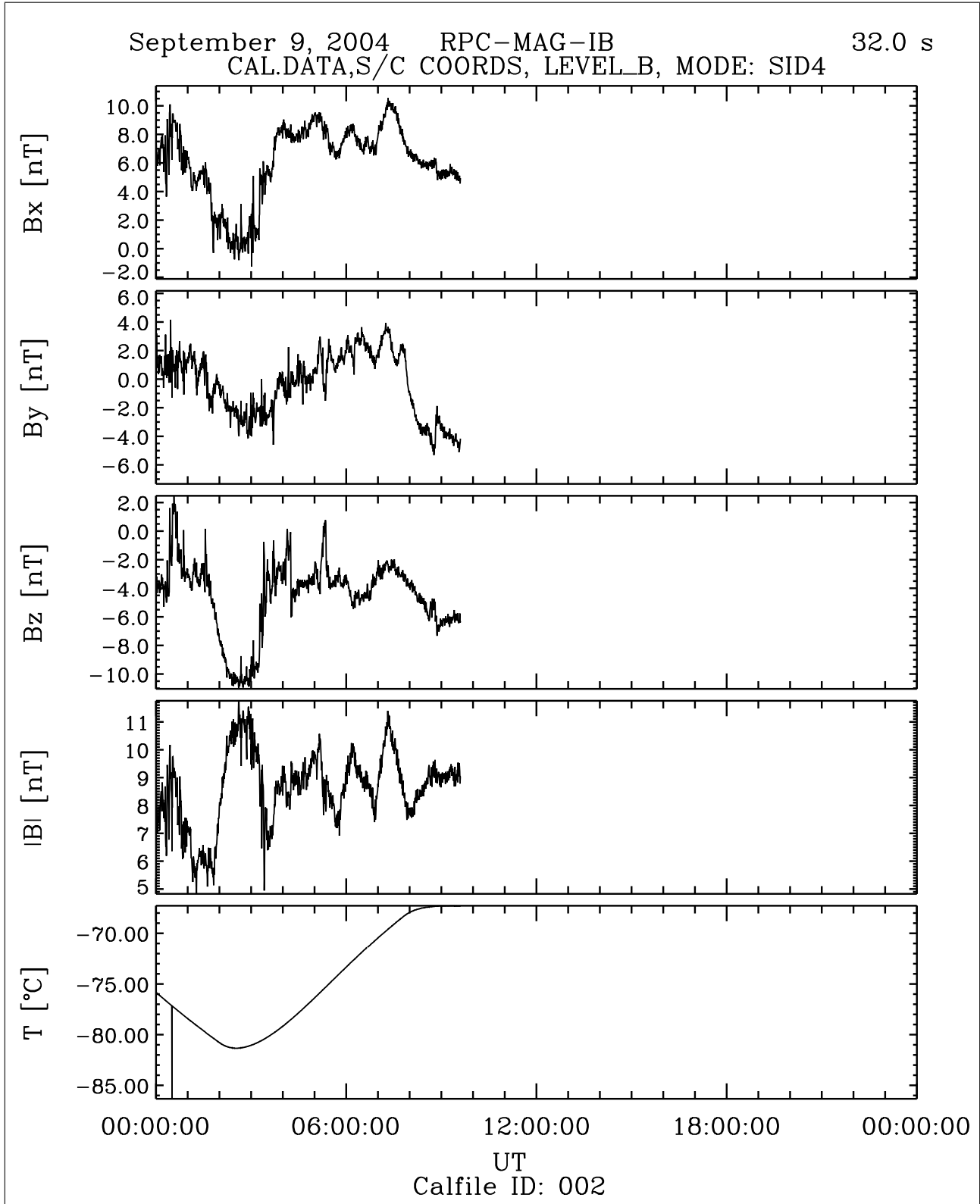


Figure 59: File: RPCMAG040909T0000\_CLB\_IB\_M4\_T0000\_2400\_002

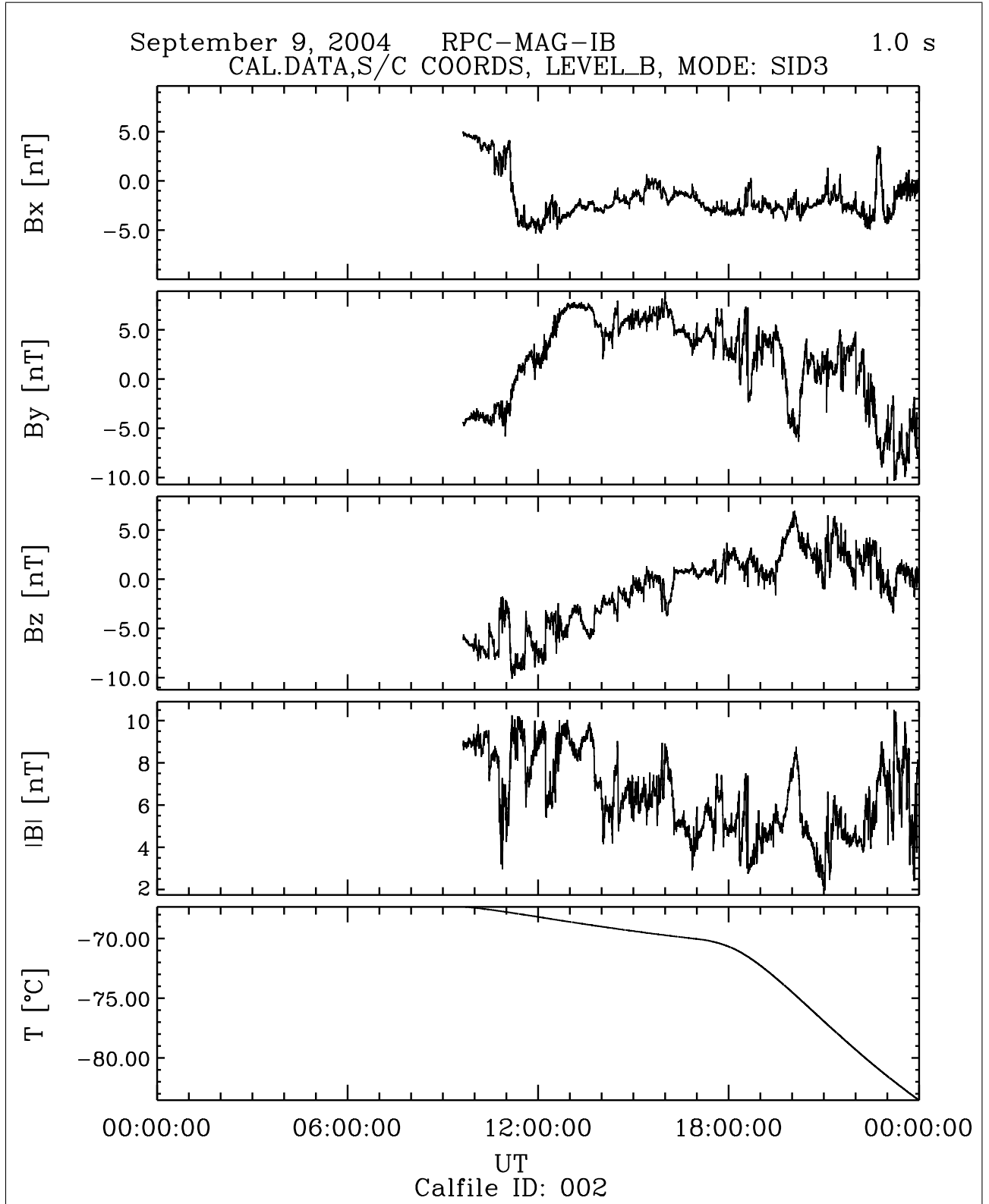


Figure 60: File: RPCMAG040909T0938\_CLB\_IB\_M3\_T0000\_2400\_002

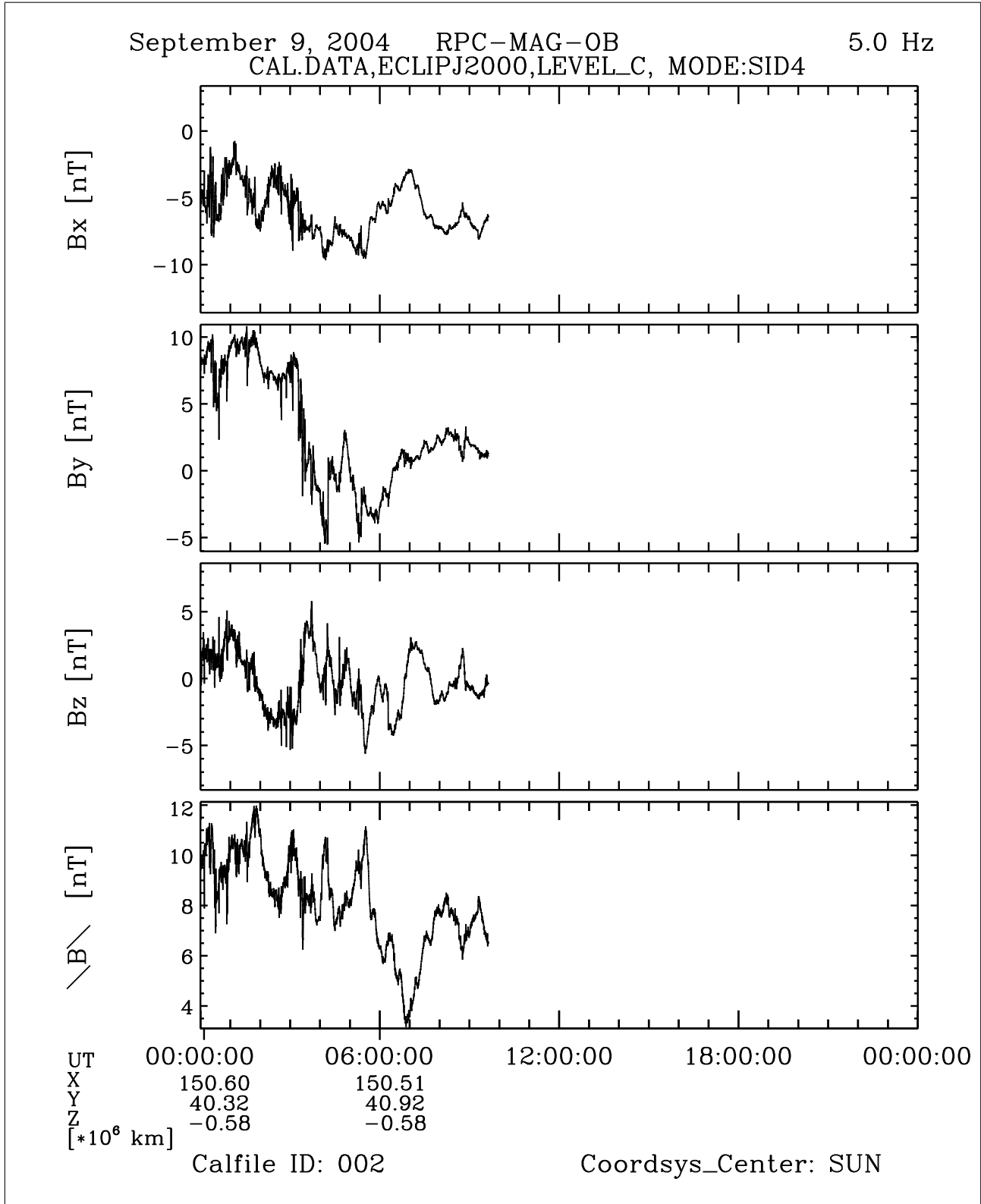


Figure 61: File: RPCMAG040909T0000\_CLC\_OB\_M4\_T0000\_2400\_002



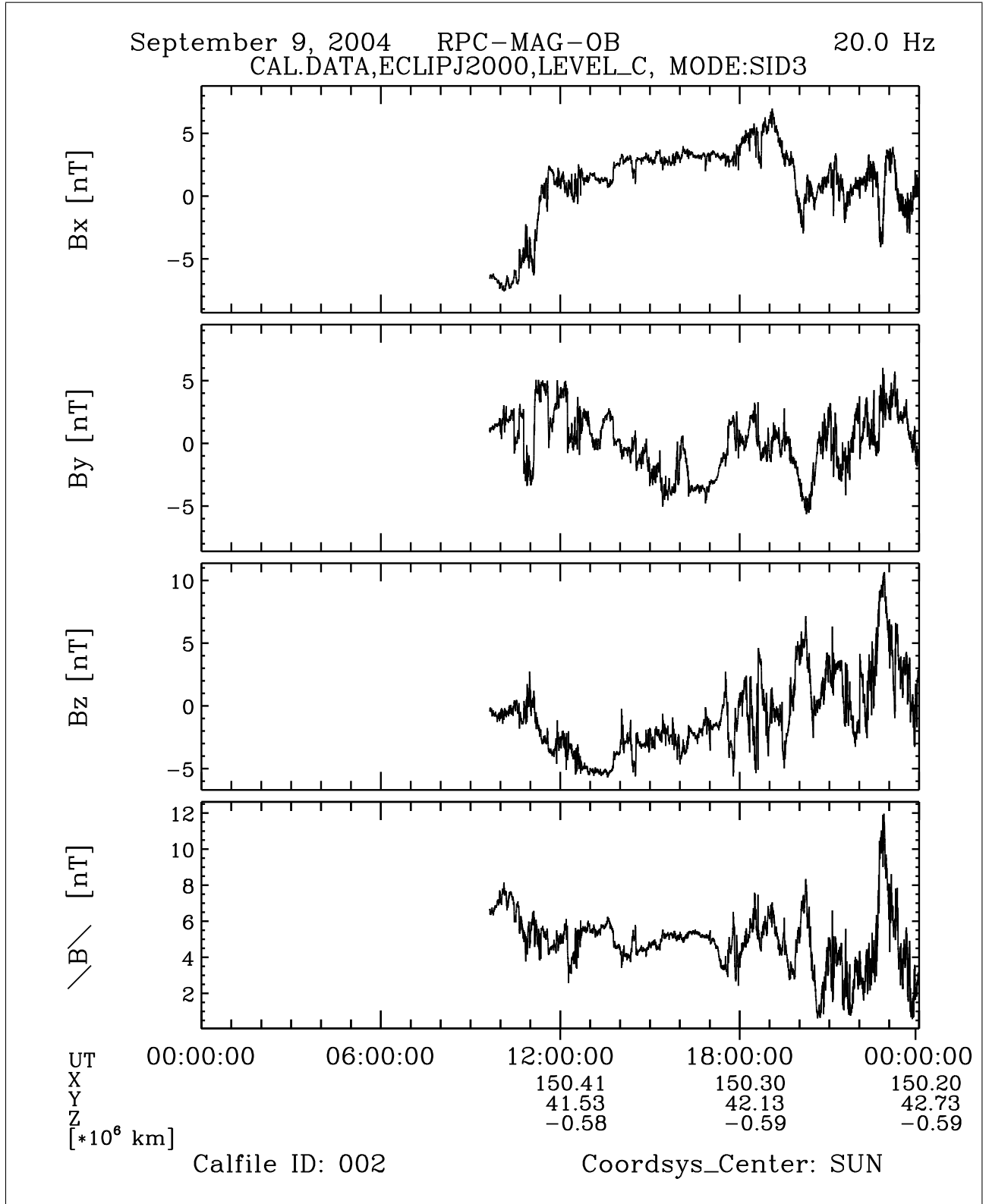


Figure 62: File: RPCMAG040909T0938\_CLC\_OB\_M3\_T0000\_2400\_002

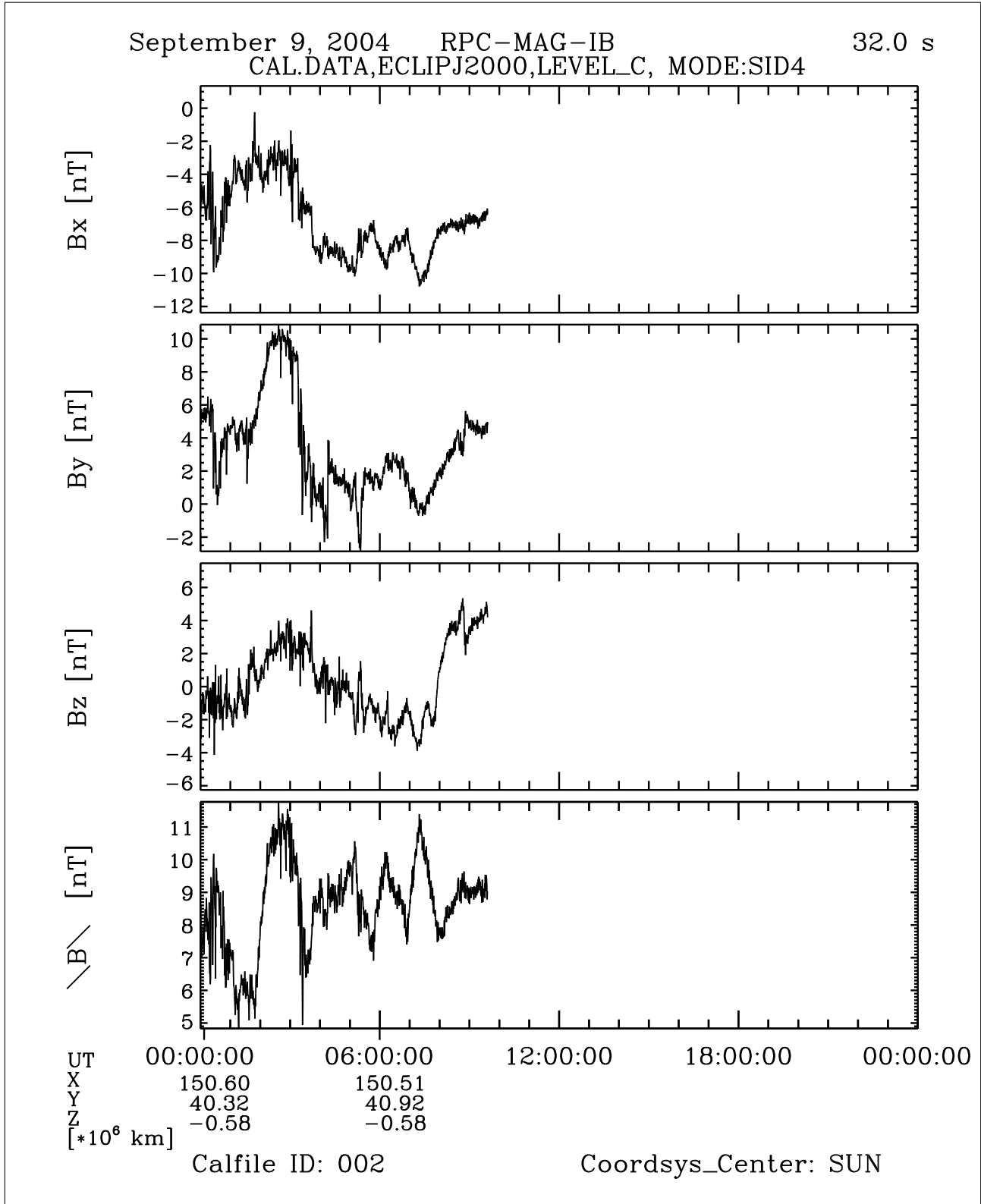


Figure 63: File: RPCMAG040909T0000\_CLC\_IB\_M4\_T0000\_2400\_002

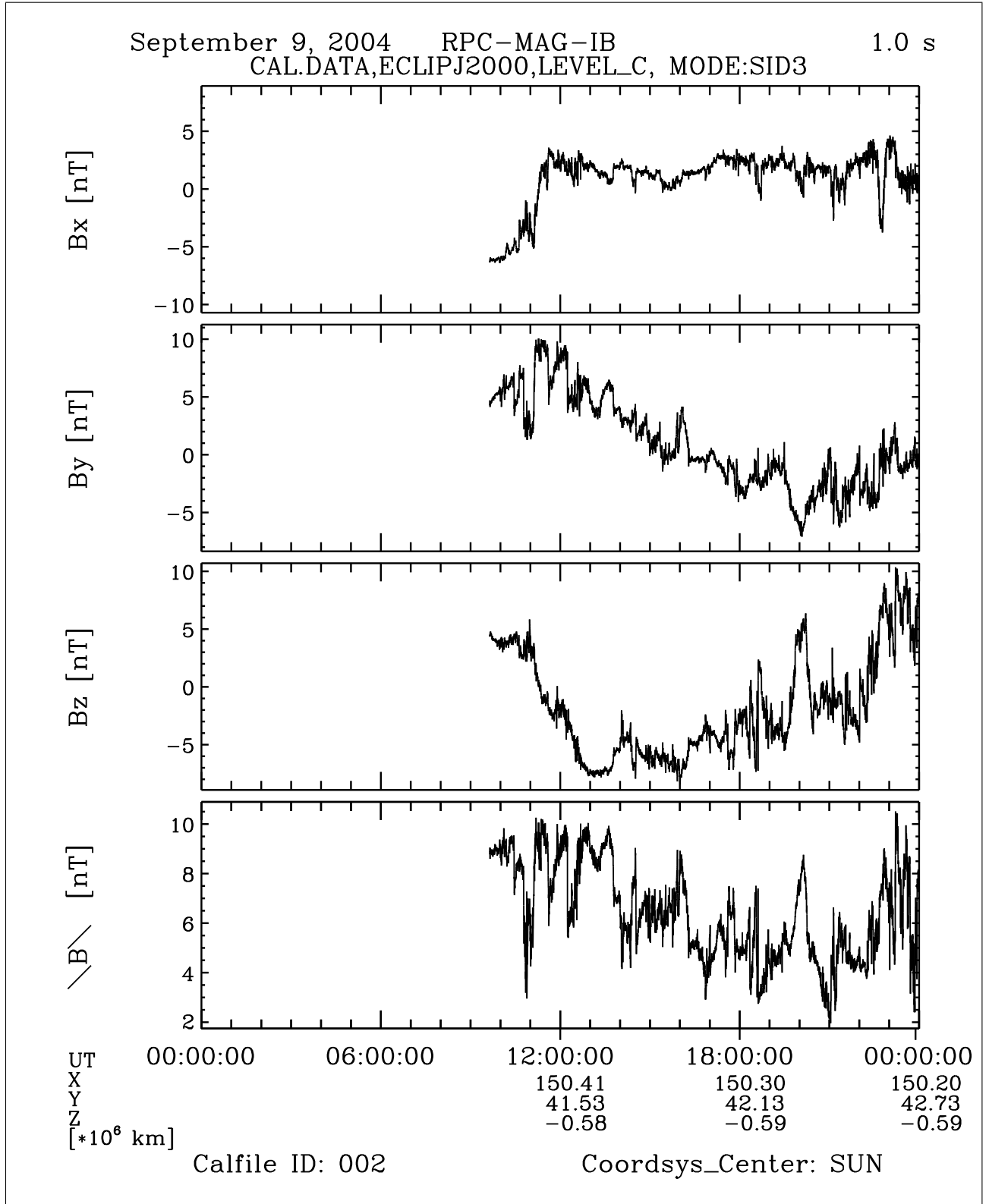


Figure 64: File: RPCMAG040909T0938\_CLC\_IB\_M3\_T0000\_2400\_002

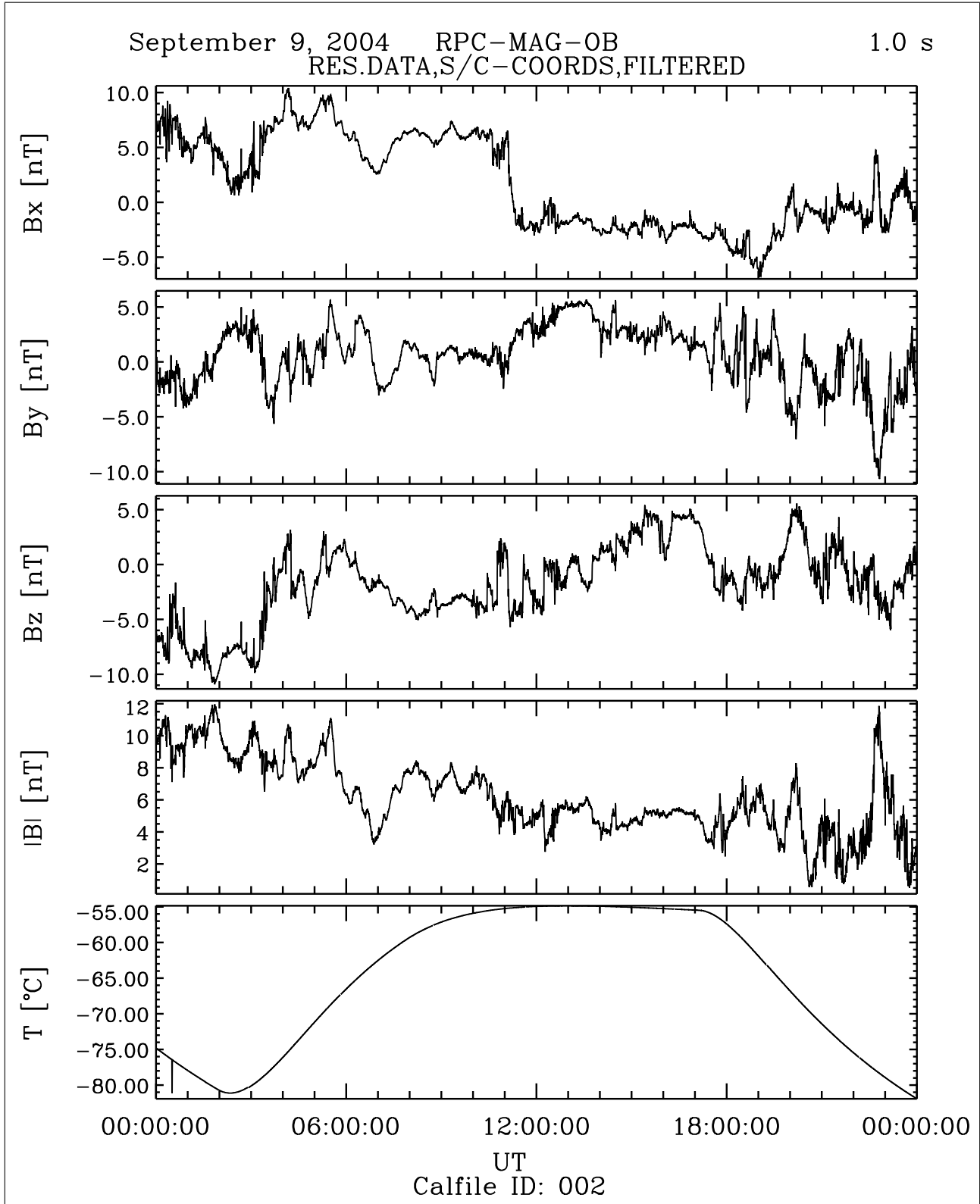


Figure 65: File: RPCMAG040909\_CLF\_OB\_A1\_T0000\_2400\_002

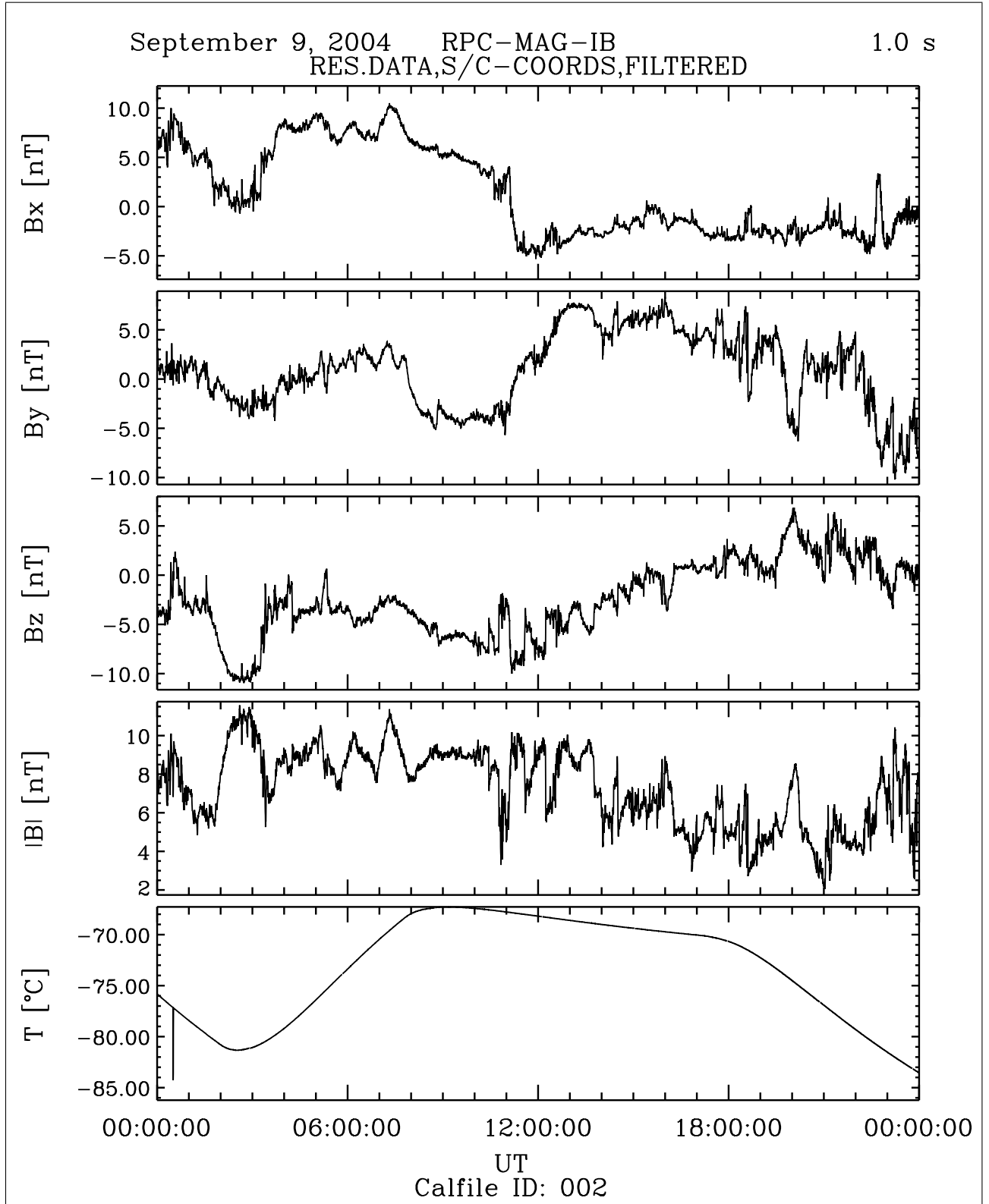


Figure 66: File: RPCMAG040909\_CLF\_IB\_A1\_T0000\_2400\_002

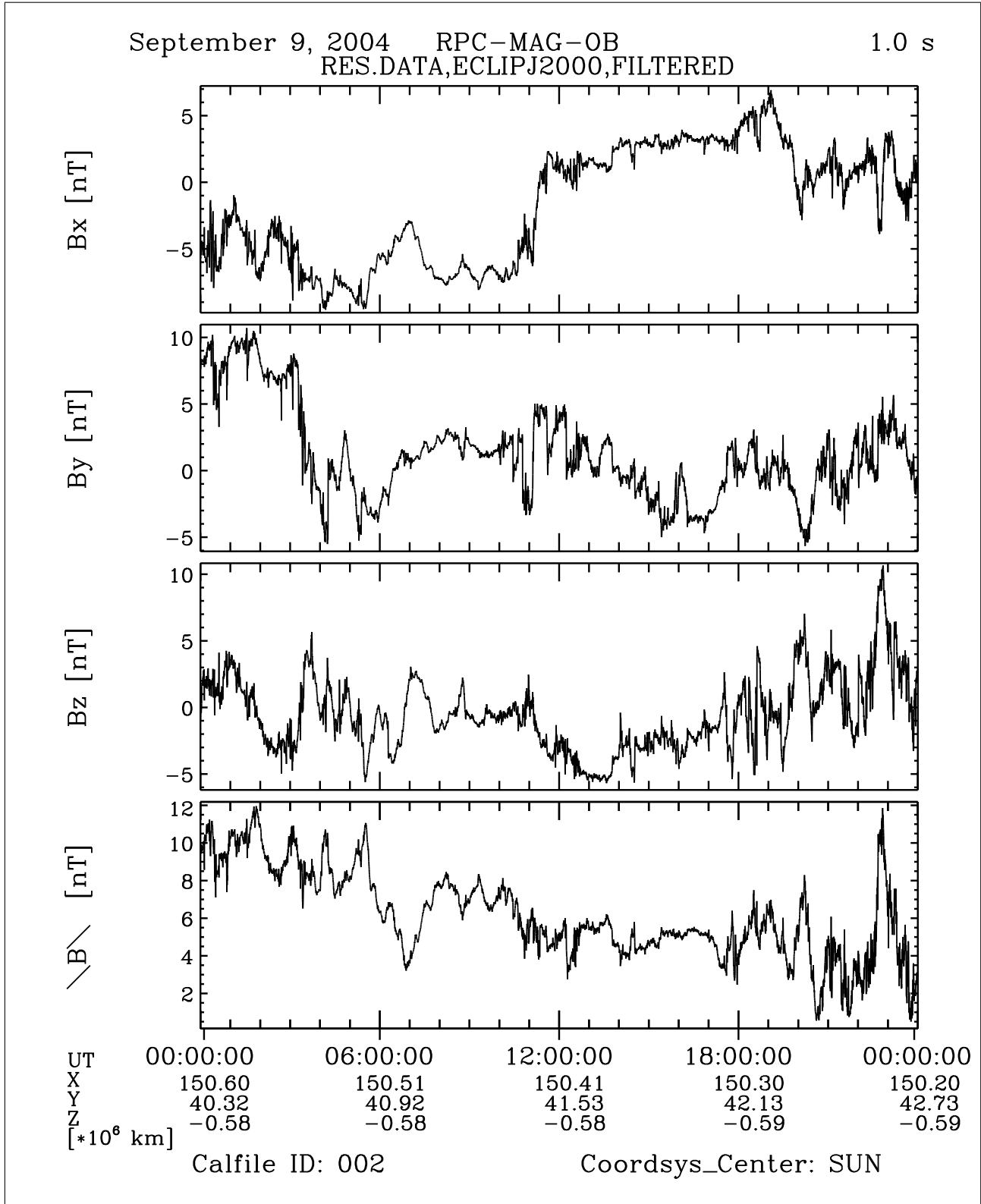


Figure 67: File: RPCMAG040909\_CLG\_OB\_A1.T0000\_2400\_002

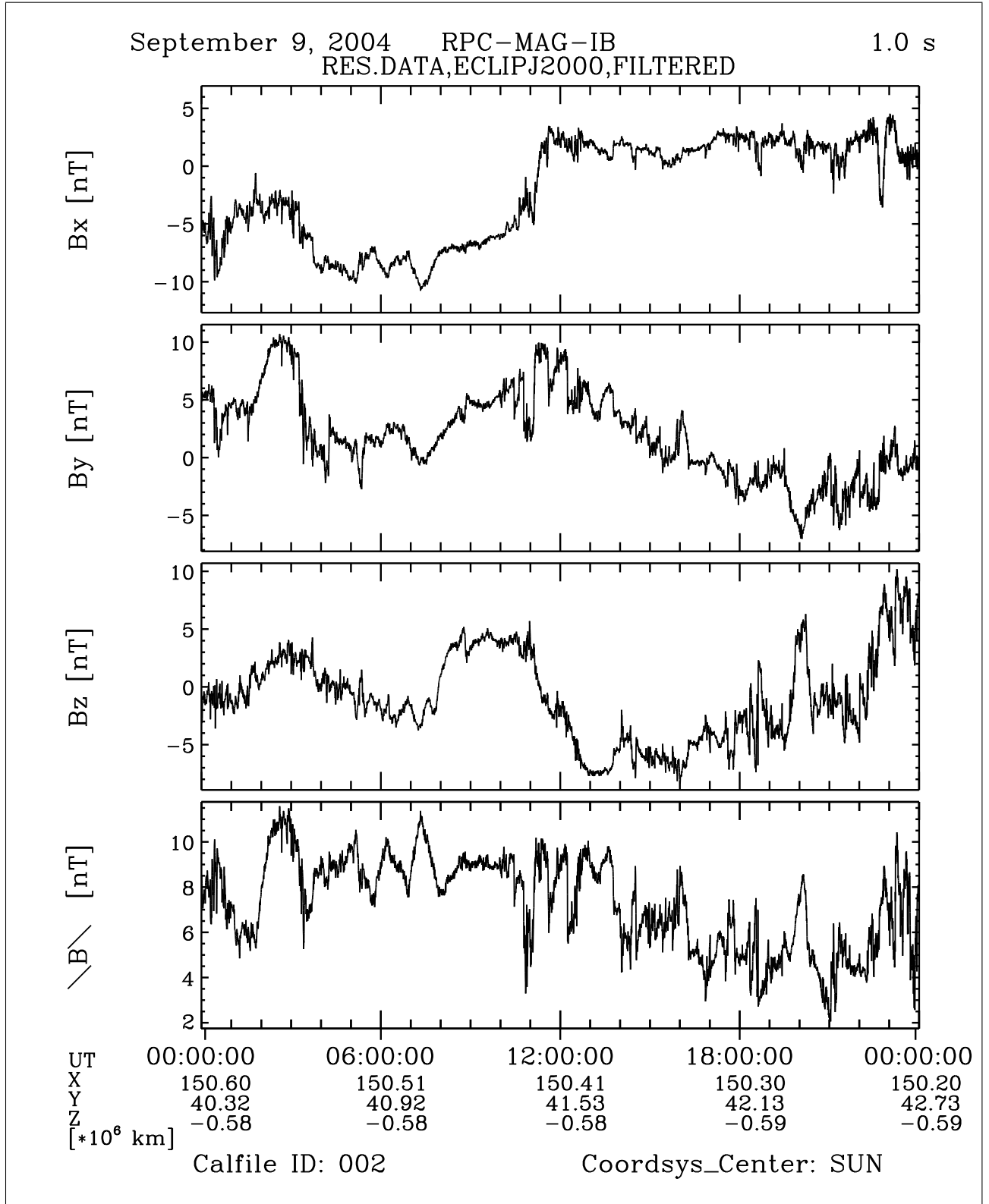


Figure 68: File: RPCMAG040909\_CLG\_IB\_A1\_T0000\_2400\_002

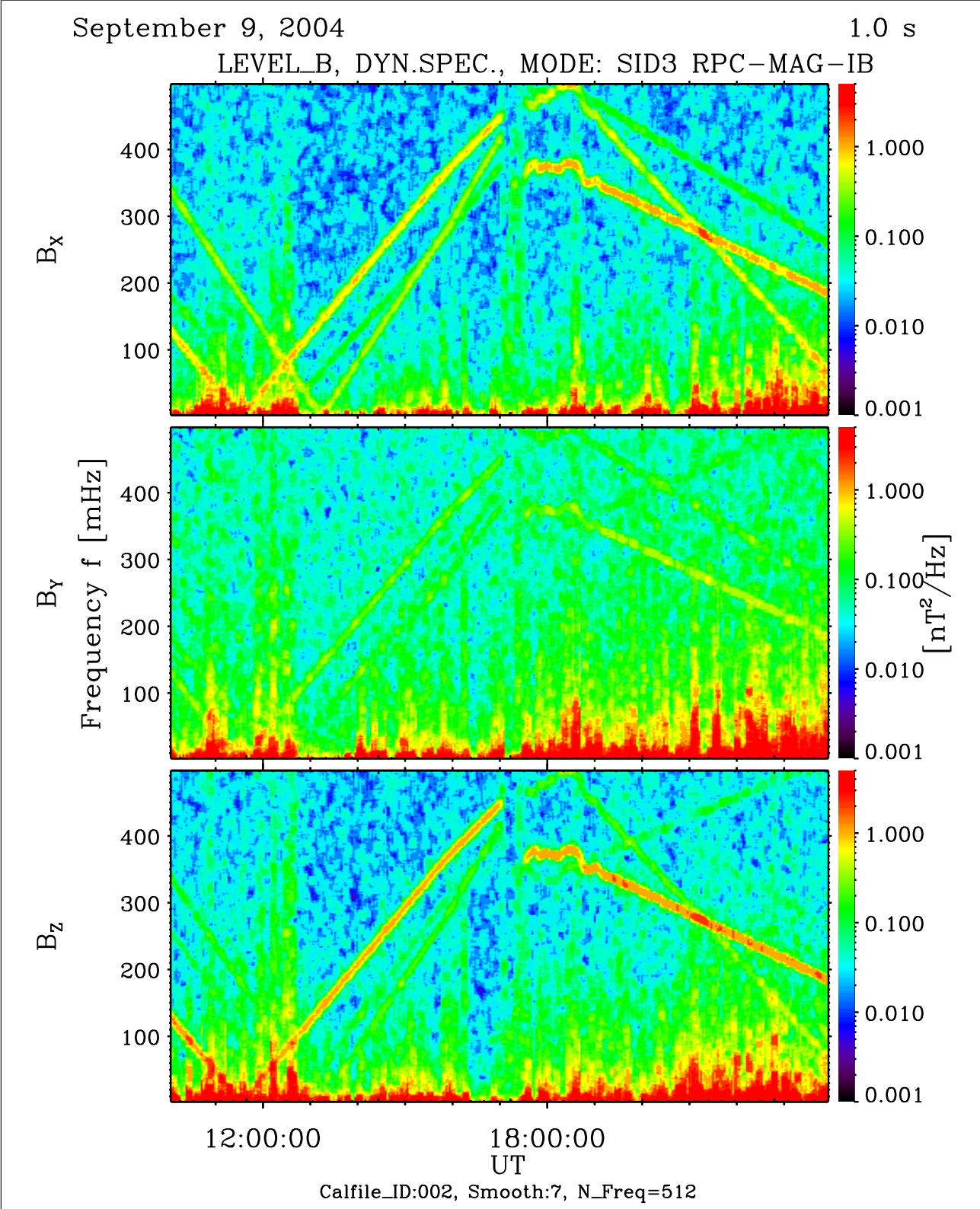


Figure 69: File: RPCMAG040909T0938\_CLB\_IB\_M3\_DS0\_500\_002



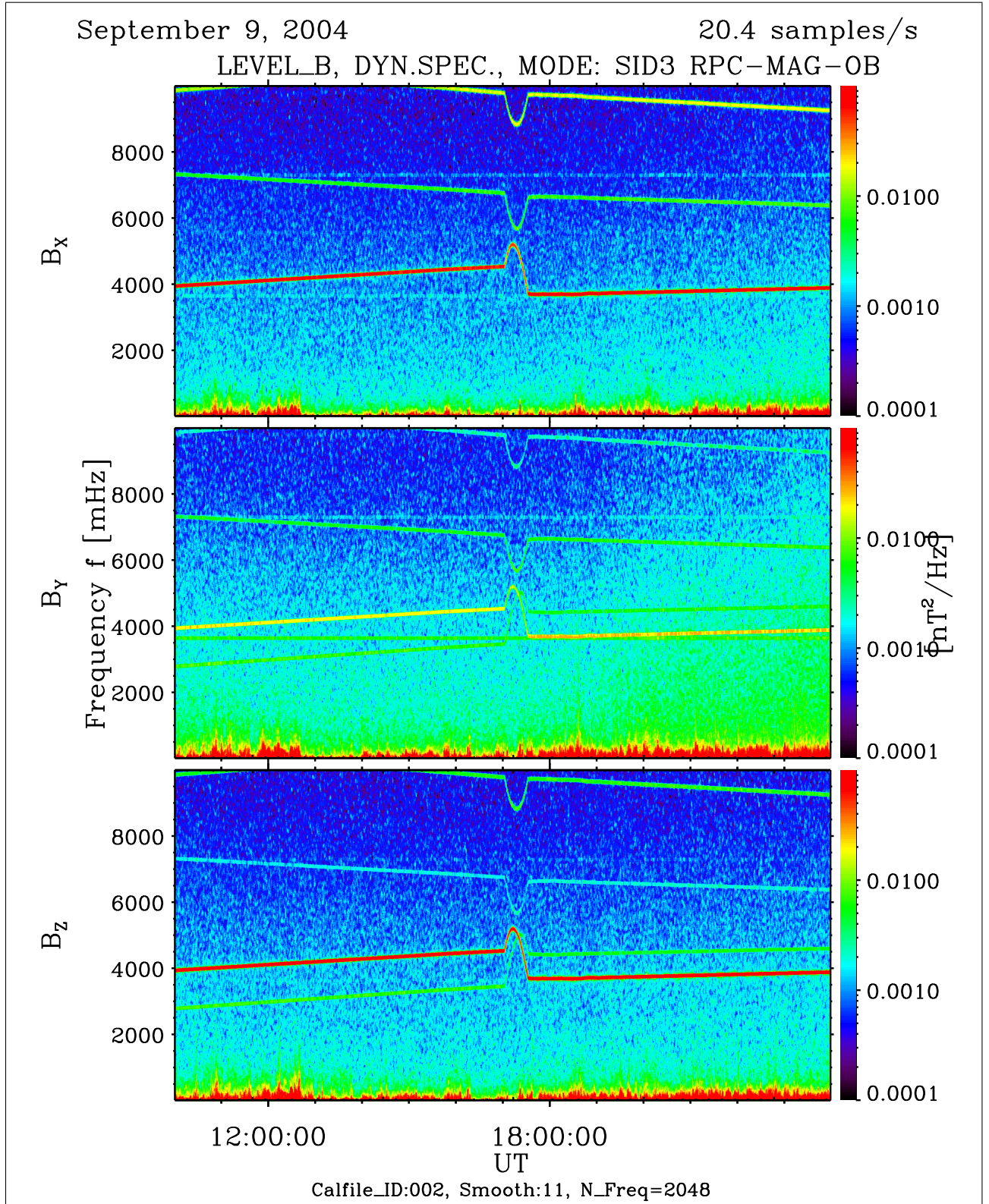


Figure 70: File: RPCMAG040909T0938\_CLB\_OB\_M3\_DS0\_10000\_002

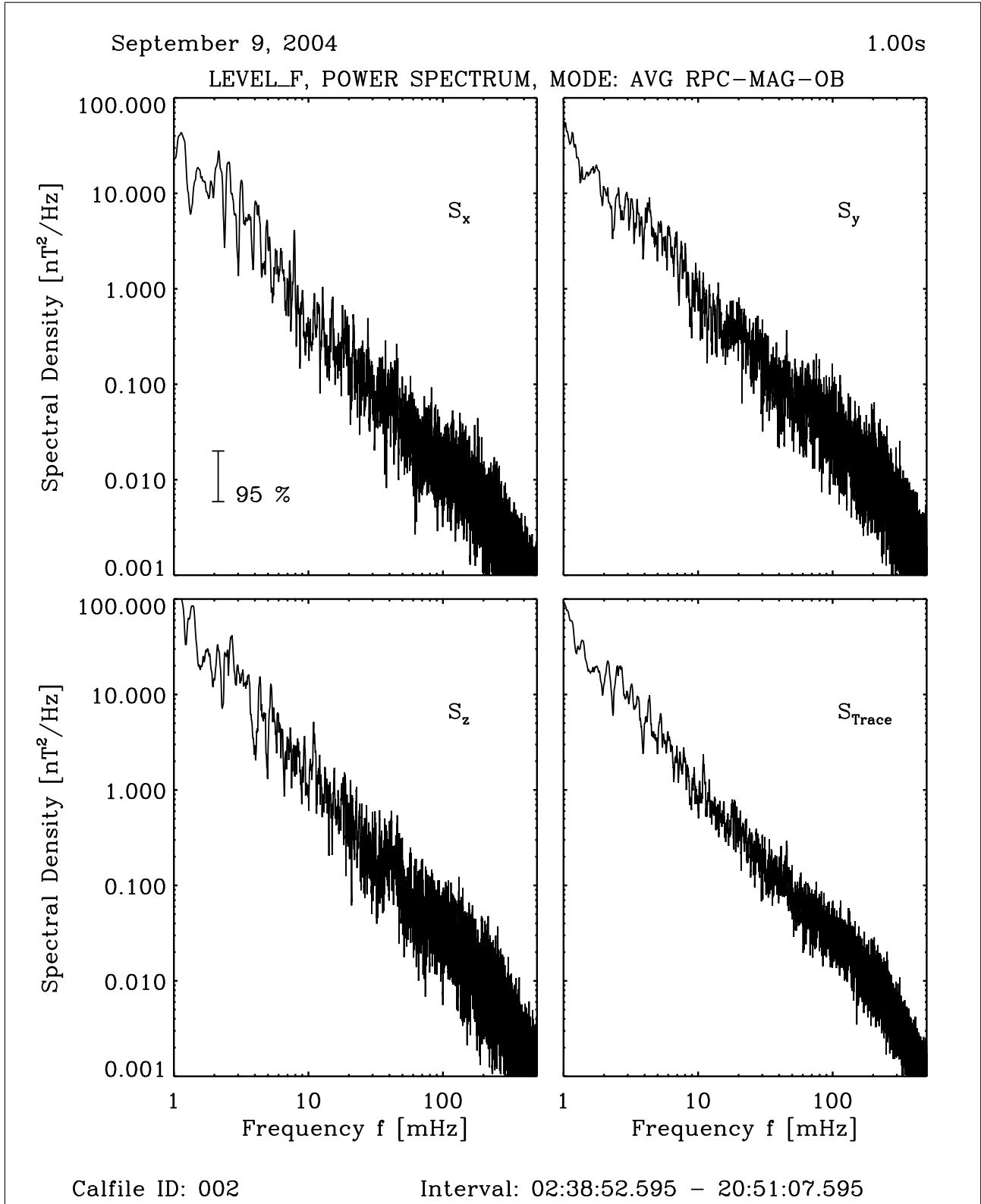


Figure 71: File: RPCMAG040909\_CLF\_OB\_A1\_PS1\_500\_002

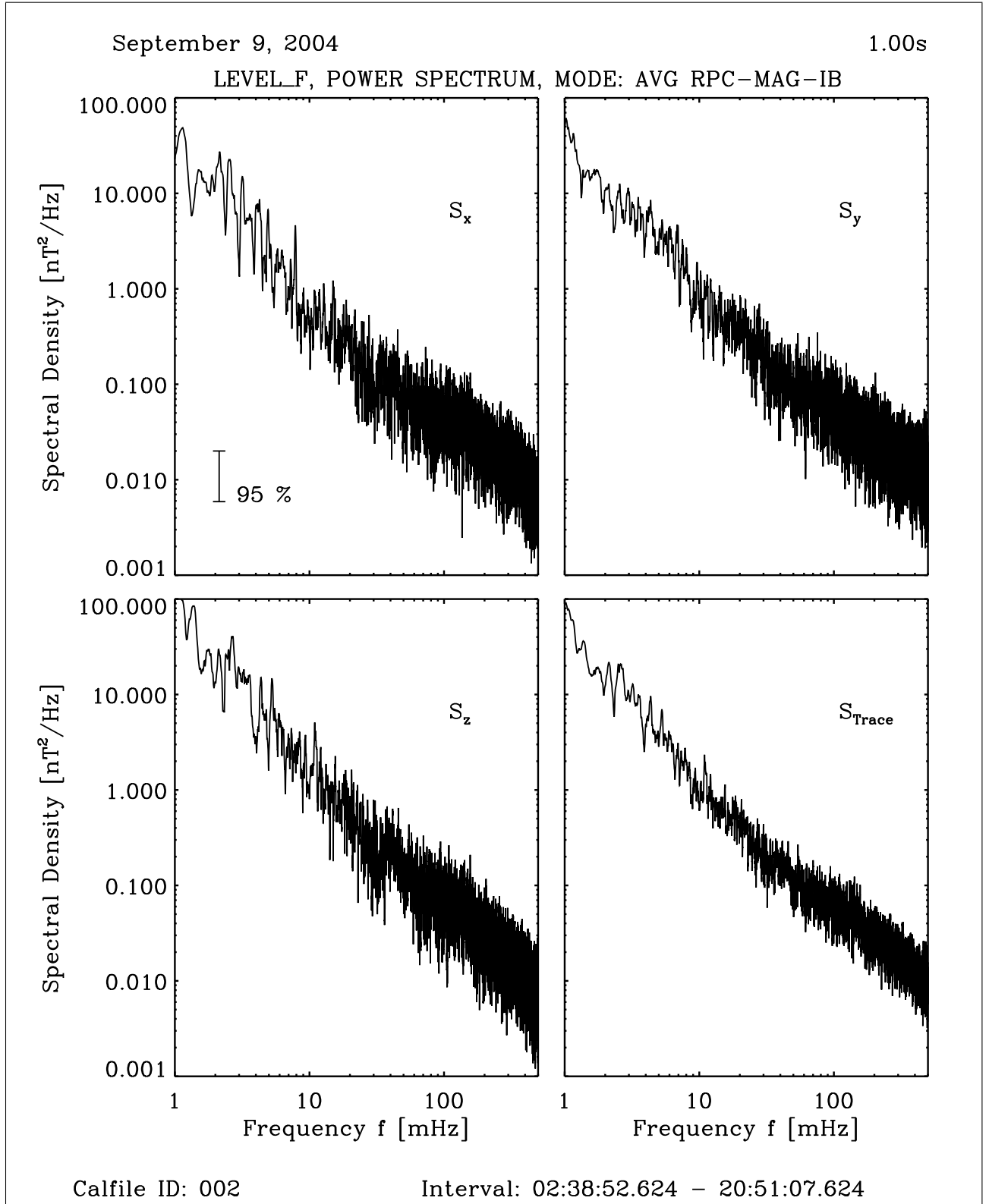


Figure 72: File: RPCMAG040909\_CLF\_IB\_A1\_PS1\_500\_002

<h1 style="margin: 0;">R O S E T T A</h1>	Document: RO-IGEP-TR-0010 Issue: 3 Revision: 2
<h1 style="margin: 0;">IGEP</h1>	Institut für Geophysik u. extraterr. Physik Technische Universität Braunschweig Date: April 12, 2007 Page: 82

### 5.3 Plots of ROSETTA's Reaction Wheels Speeds

The following plots show the time series of the revolutions of the 4 reaction wheels. Two kinds of data are shown:

- The original reaction wheel data as they are stored in the DDS.
- The theoretical response of the wheels impact seen by an instrument sampling with different frequencies. Here the response in the at 20 Hz, 5 Hz and 1 Hz sampling frequency is plotted.

A comparison with the dynamic spectra of the MAG data gives an impressive accordance between the reaction wheel frequencies and the spectral lines observed in the dynamic MAG spectra.

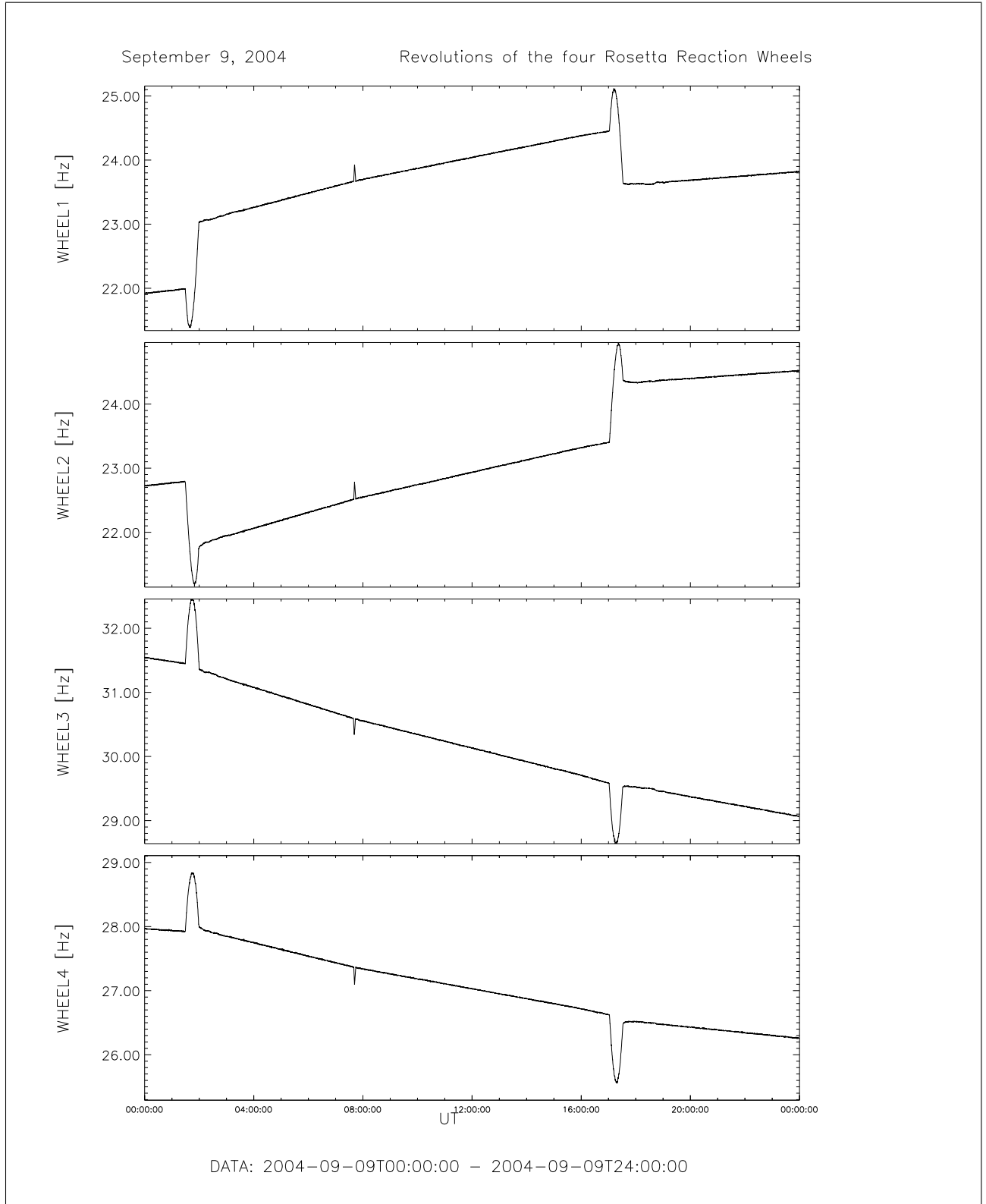


Figure 73: File: wheels\_Hz2004-09-09T00-00

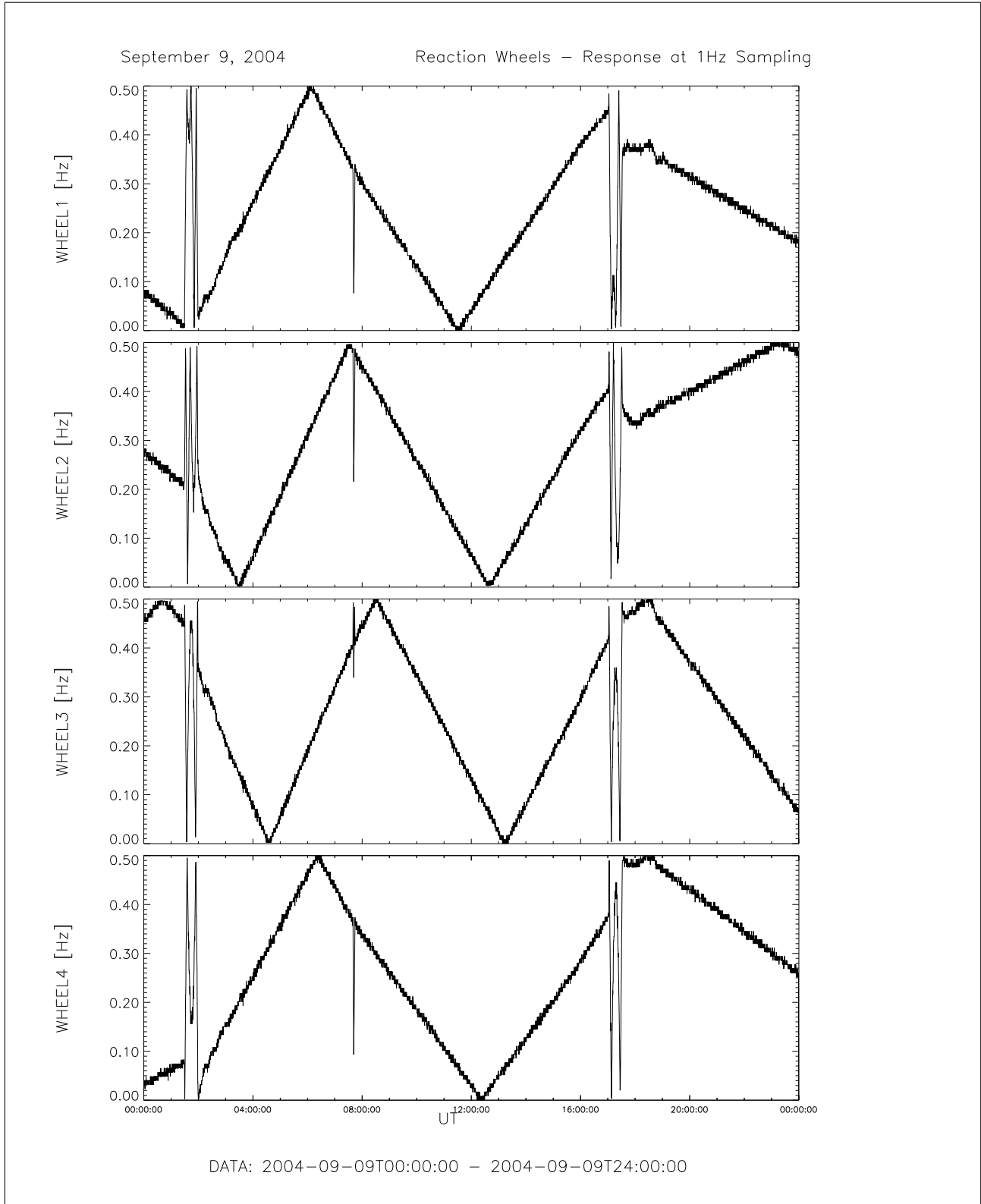


Figure 74: File: wheels\_1Hz\_Sampling2004-09-09T00-00

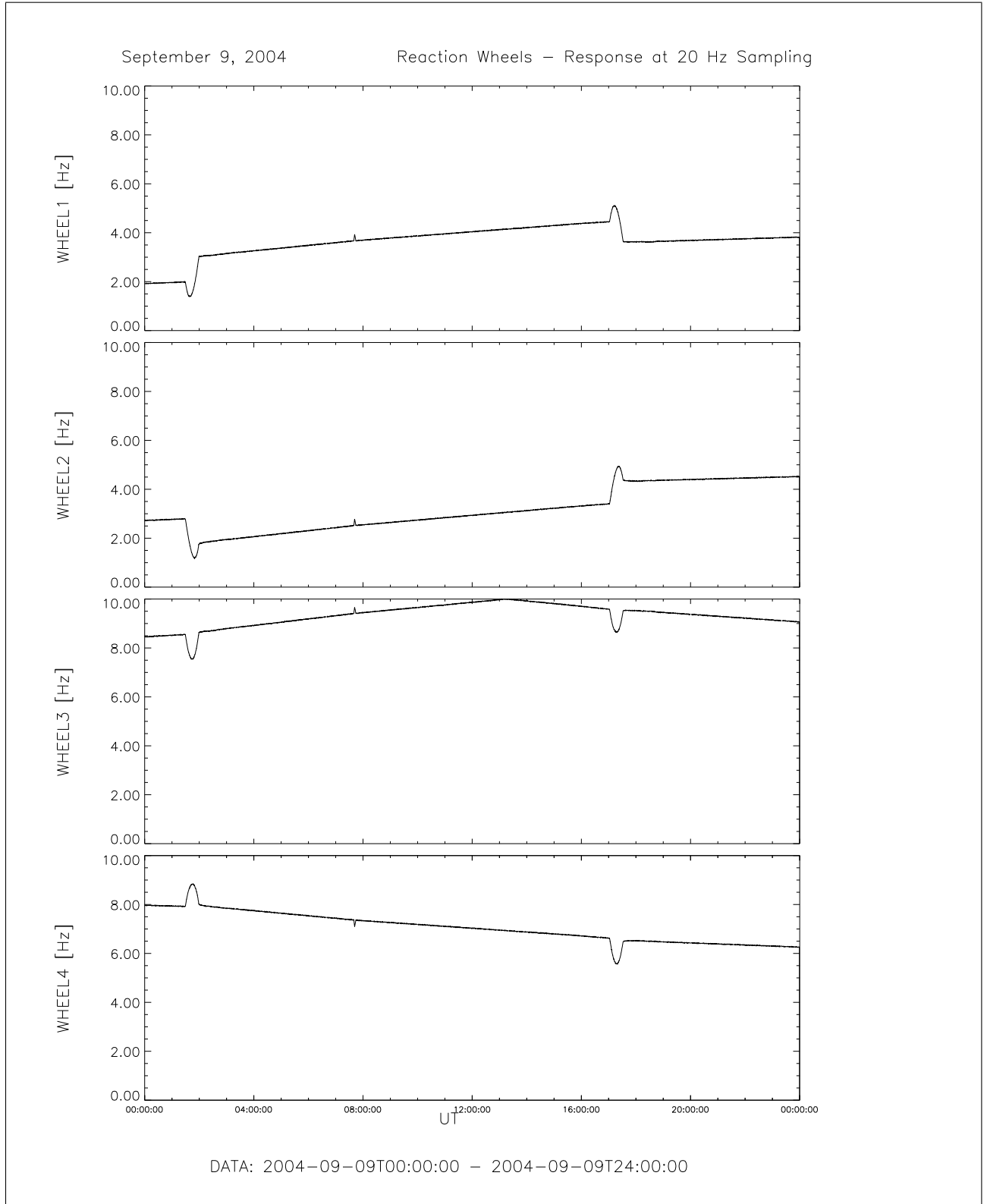


Figure 75: File: wheels\_20Hz\_Sampling2004-09-09T00-00

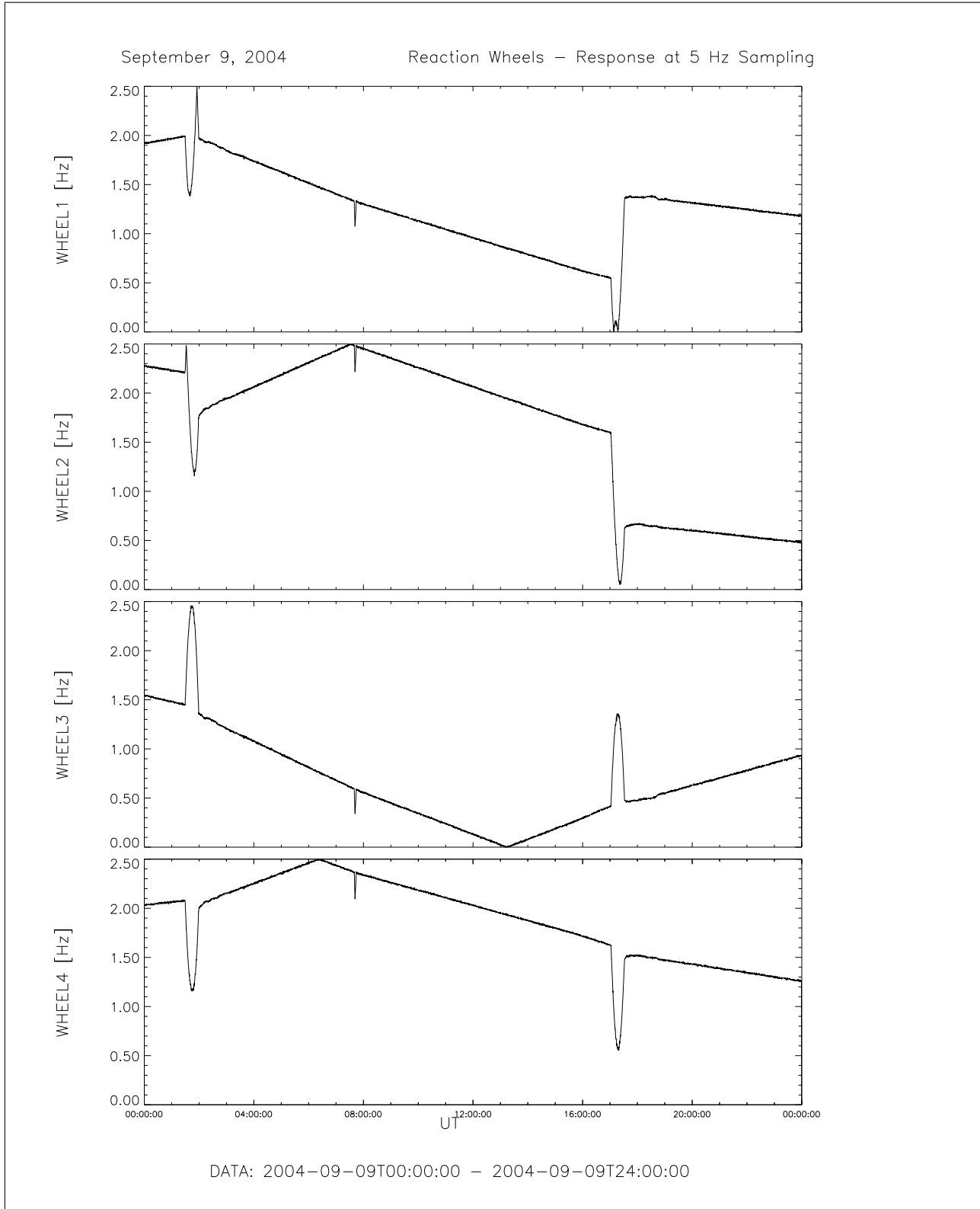


Figure 76: File: wheels\_5Hz\_Sampling2004-09-09T00-00



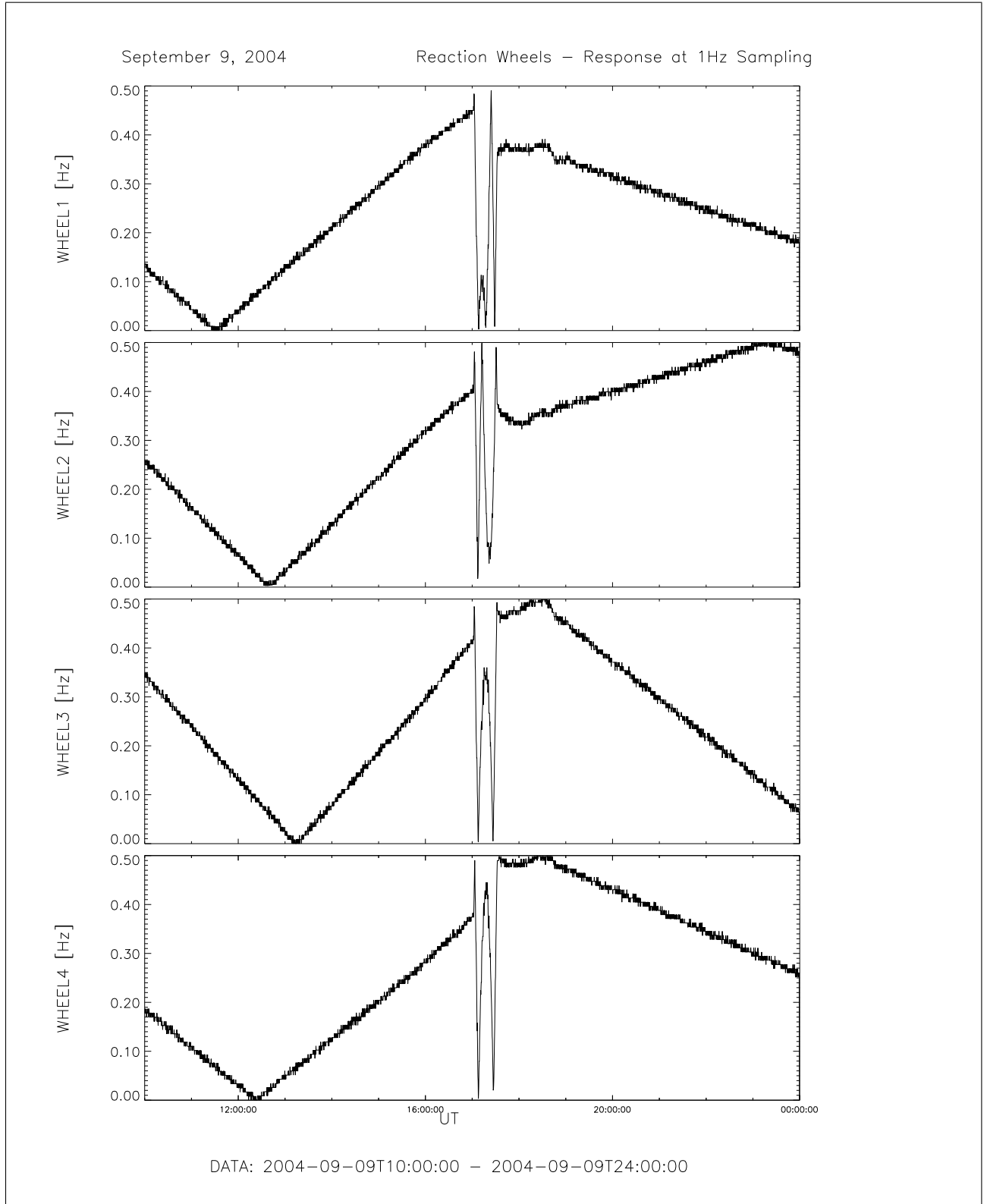


Figure 77: File: wheels\_1Hz\_Sampling2004-09-09T10-00

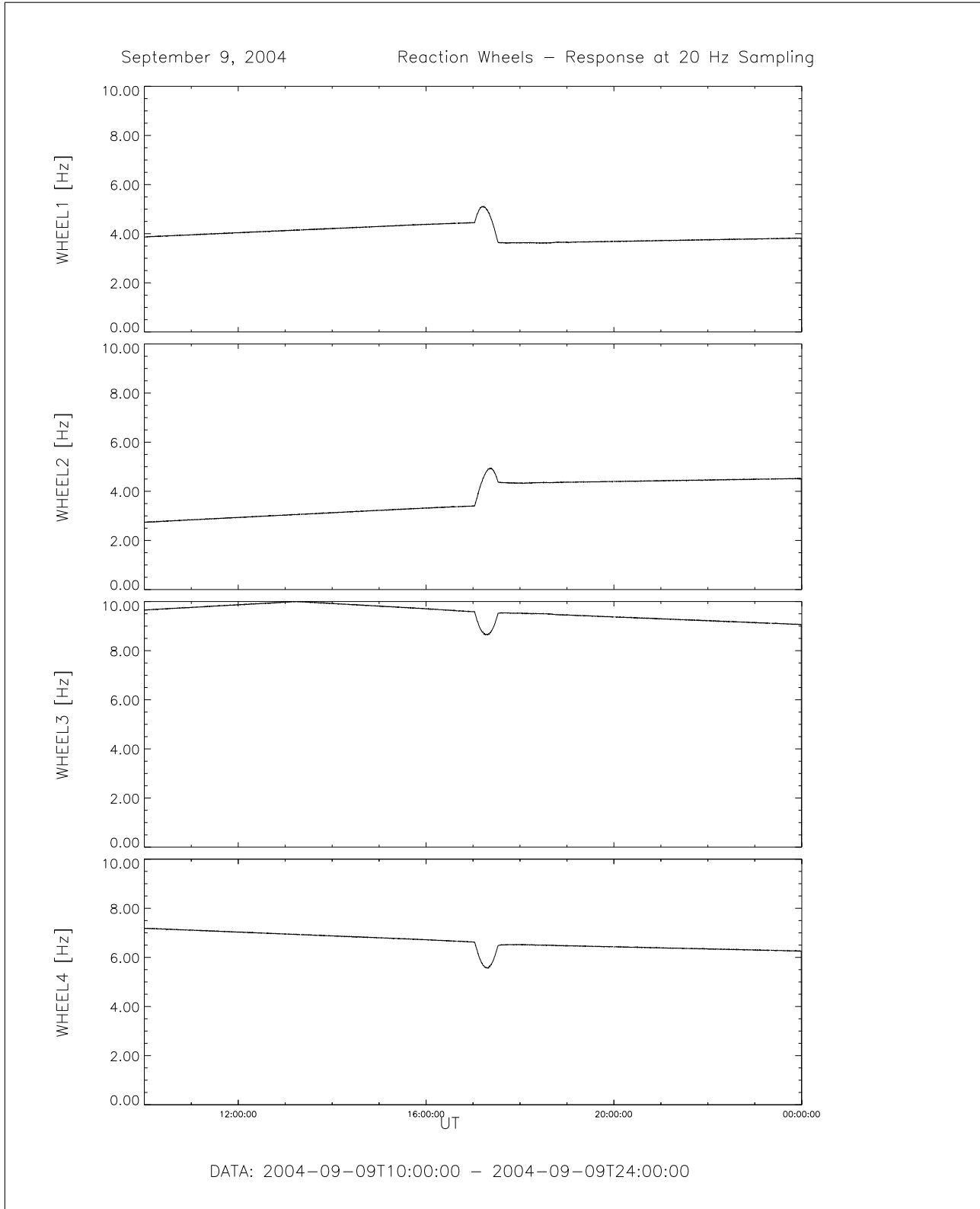


Figure 78: File: wheels\_20Hz\_Sampling2004-09-09T10-00

R O S E T T A	Document: RO-IGEP-TR-0010 Issue: 3 Revision: 2
IGEP Institut für Geophysik u. extraterr. Physik Technische Universität Braunschweig	Date: April 12,2007 Page: 89

#### 5.4 Plots of ROMAP

REMARK:

The Temperature panel in the ROMAP Time series plots does not contain only dummy data.

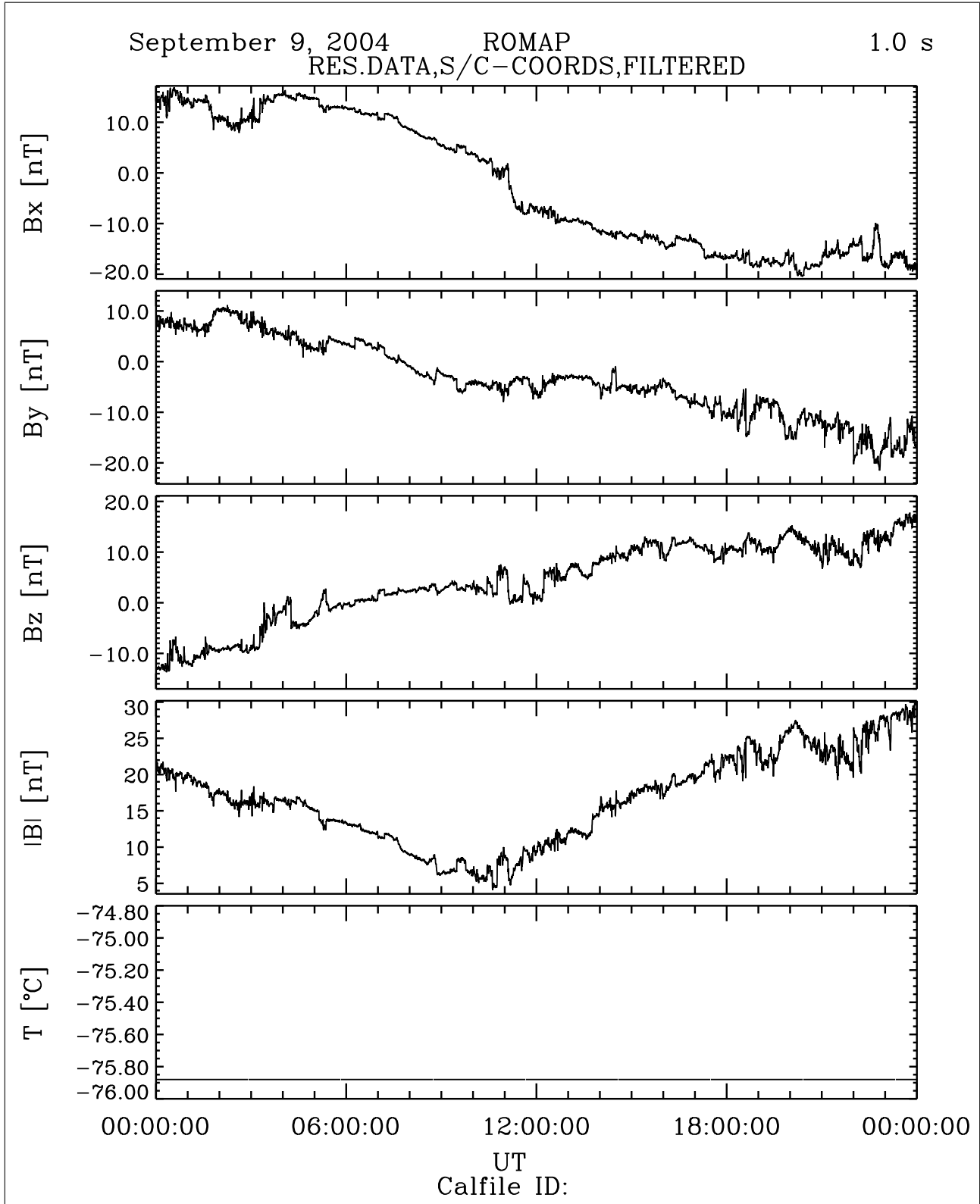


Figure 79: File: ROMAP040909\_CLF\_RO\_A1\_T0000\_2400\_UNK

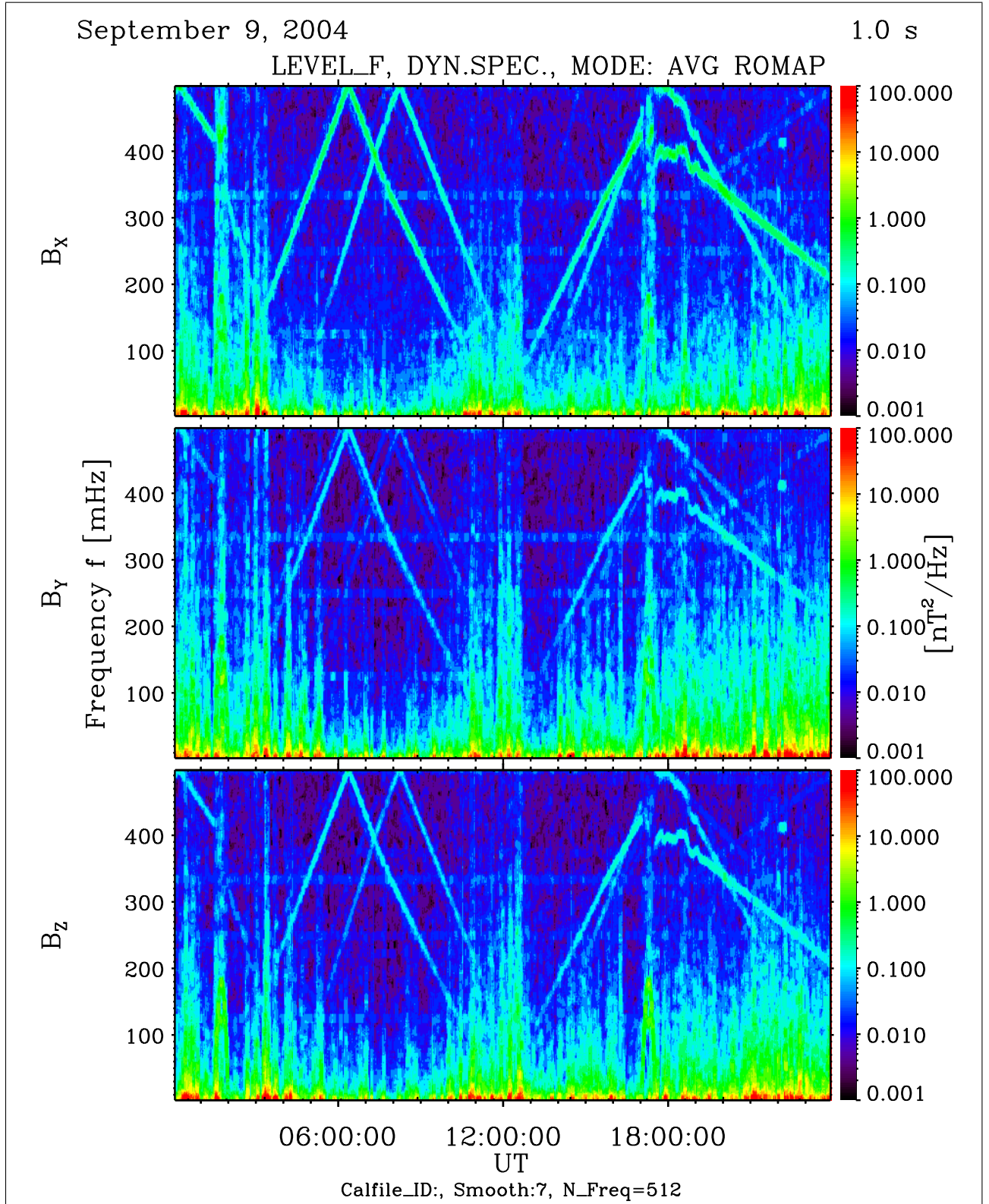


Figure 80: File: ROMAP040909\_CLF\_RO\_A1\_DS1\_500\_UNK

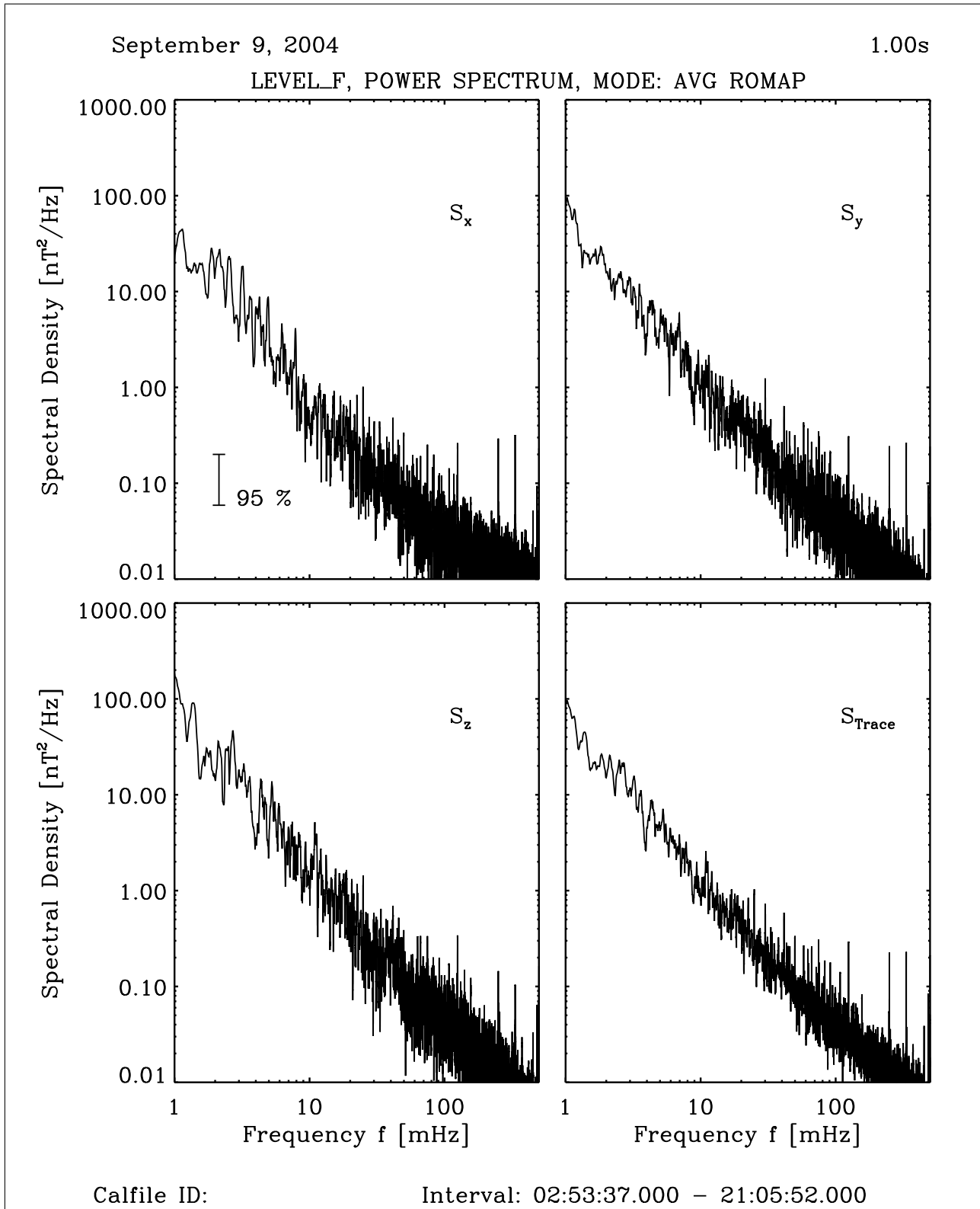


Figure 81: File: ROMAP040909\_CLF\_RO\_A1\_PS1\_500\_UNK

R O S E T T A		Document: RO-IGEP-TR-0010
		Issue: 3
		Revision: 2
IGEP	Institut für Geophysik u. extraterr. Physik	Date: April 12,2007
	Technische Universität Braunschweig	Page: 93

## 6 September 10, 2004:

### 6.1 Actions

Time	Stage A, Stage B, Filter cfg	Stage 1, Stage 2, Stage3	Mode
00:00 – 01:21	0 0 0	0 0 0	SID3
01:21 – 01:31	1 2 0	1 2 0	SID2

### 6.2 Plots of Calibrated Data using the new Temperature Model

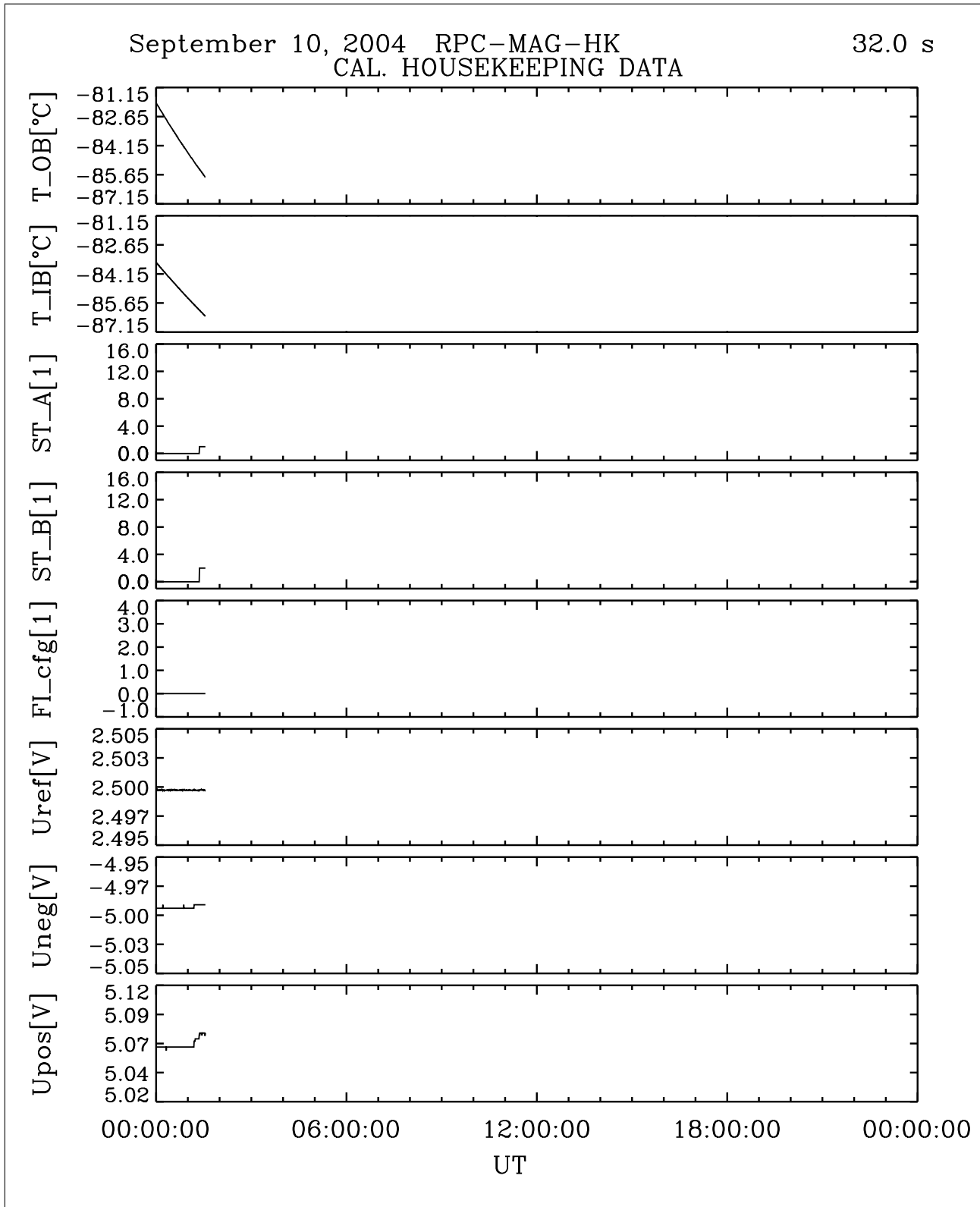


Figure 82: File: RPCMAG040910T0000\_CLA\_HK\_P0000\_2400



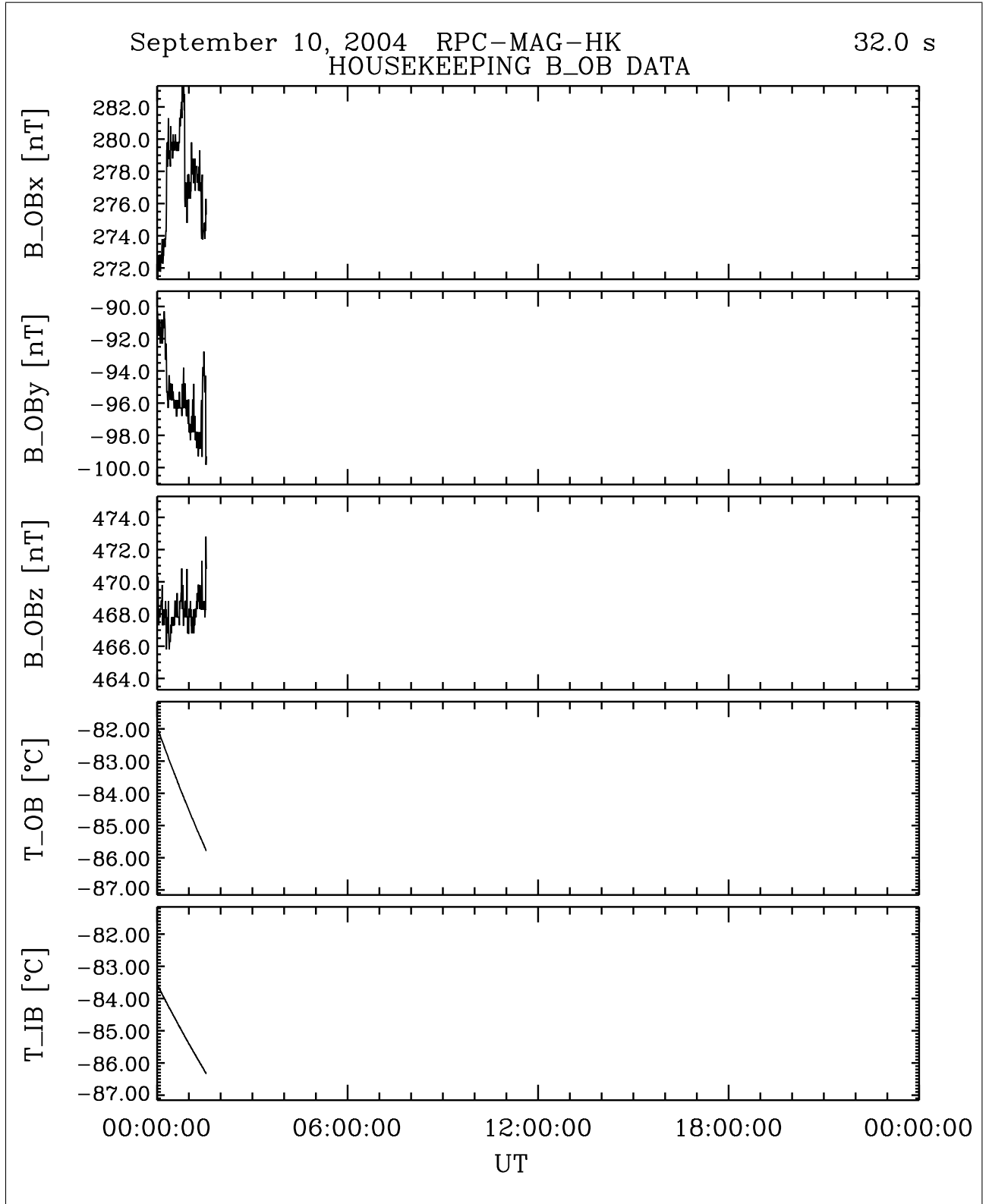


Figure 83: File: RPCMAG040910T0000\_CLA\_HK\_B\_P0000\_2400

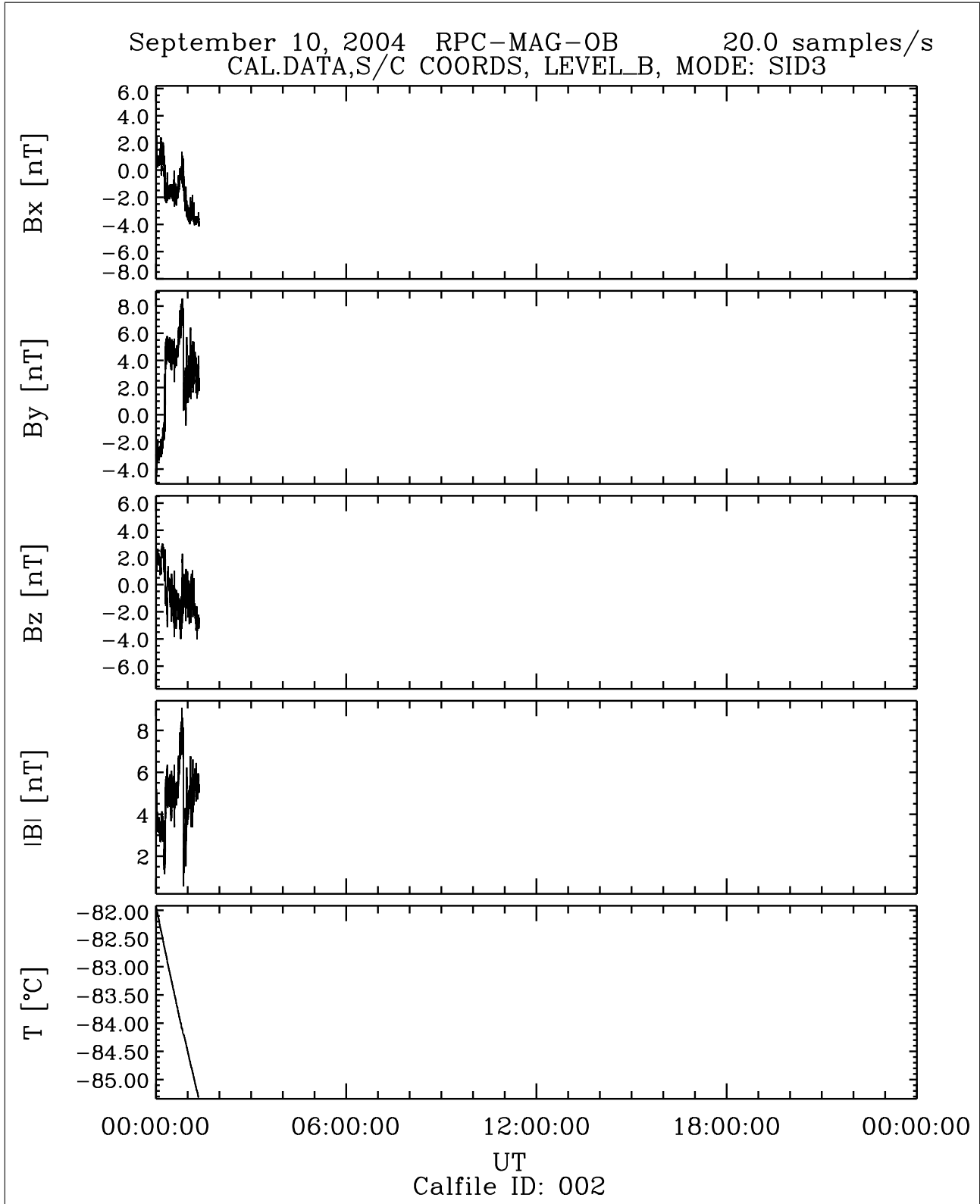


Figure 84: File: RPCMAG040910T0000\_CLB\_OB\_M3\_T0000\_2400\_002

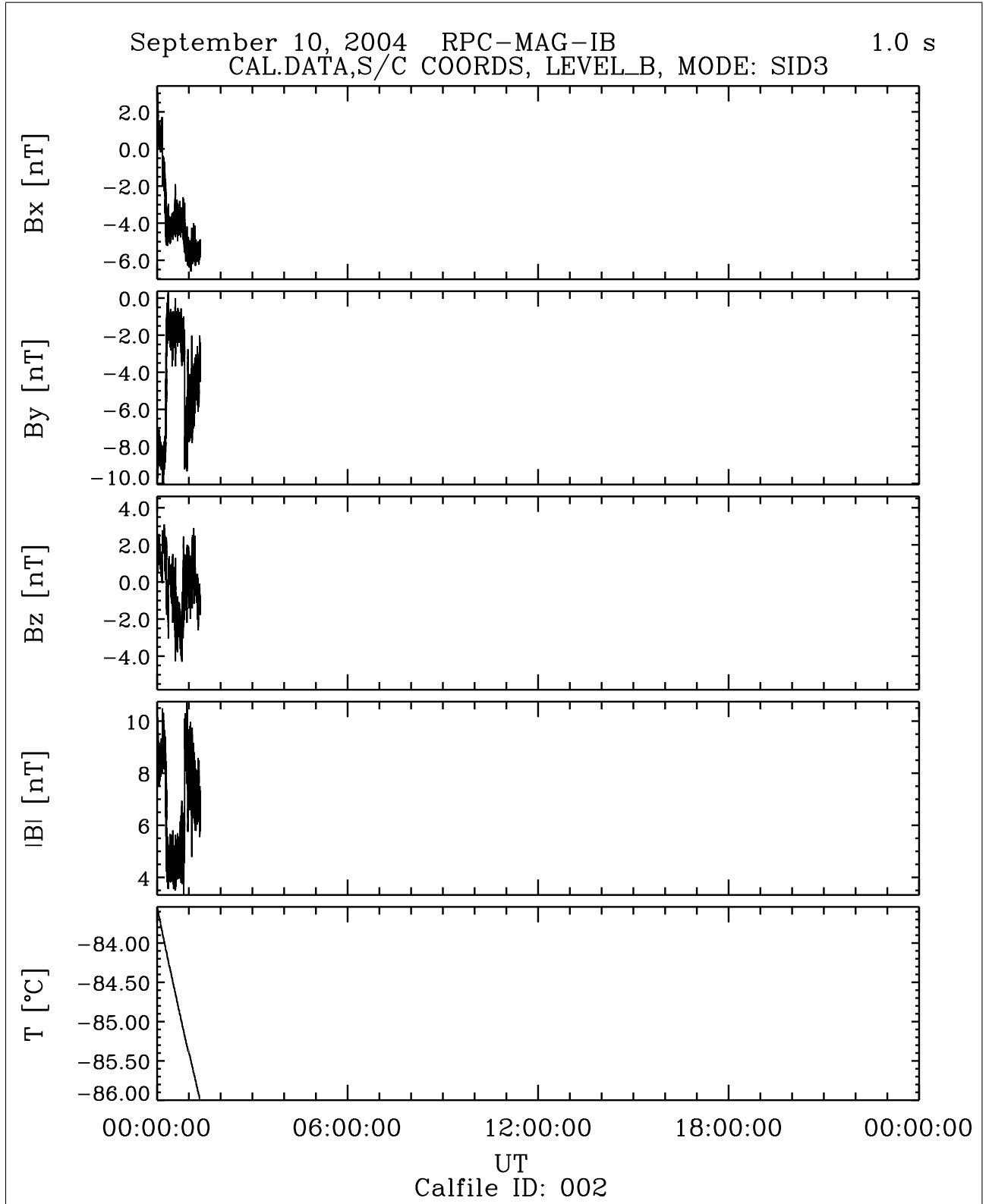


Figure 85: File: RPCMAG040910T0000\_CLB\_IB\_M3\_T0000\_2400\_002

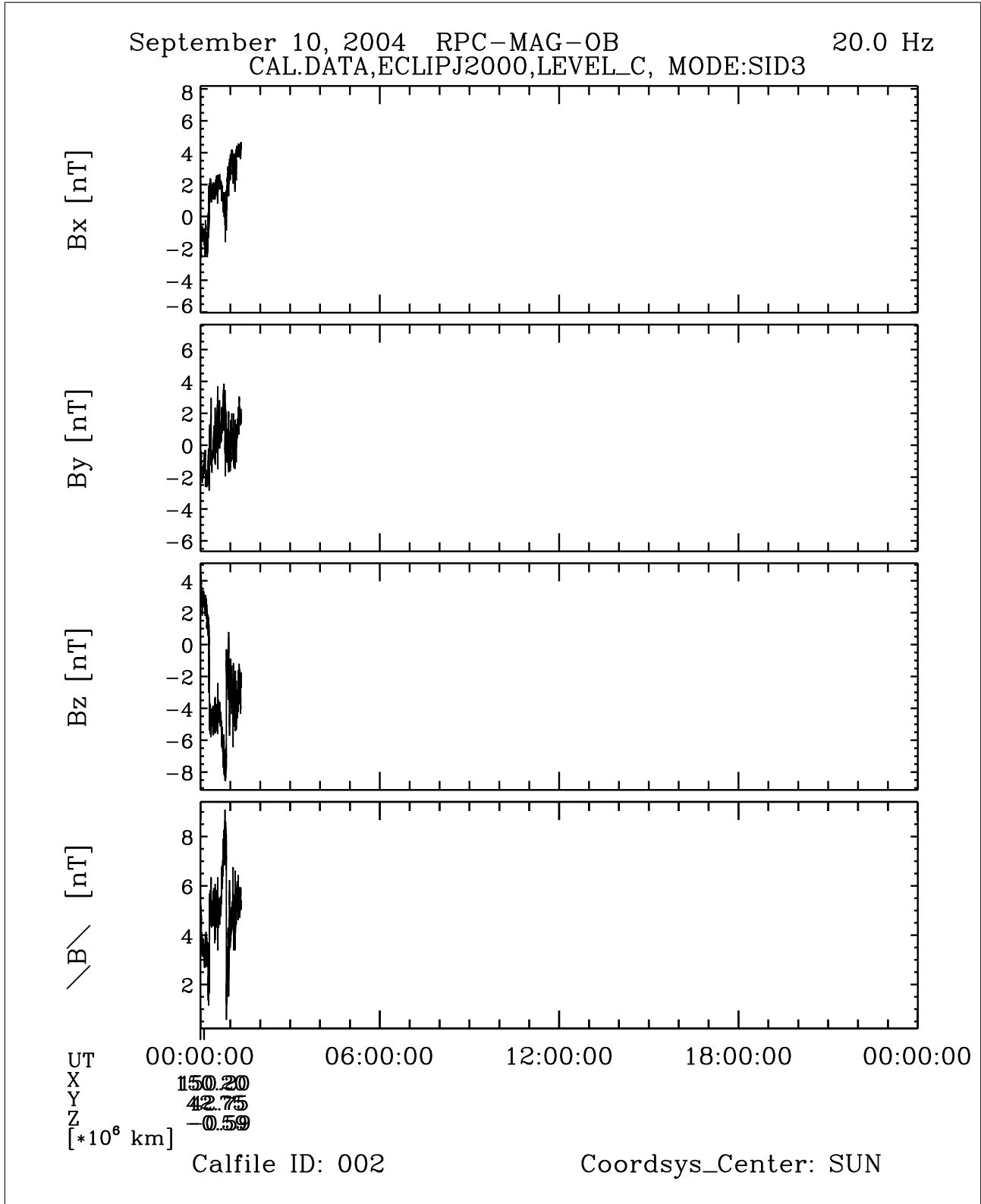


Figure 86: File: RPCMAG040910T0000\_CLC\_OB\_M3\_T0000\_2400\_002

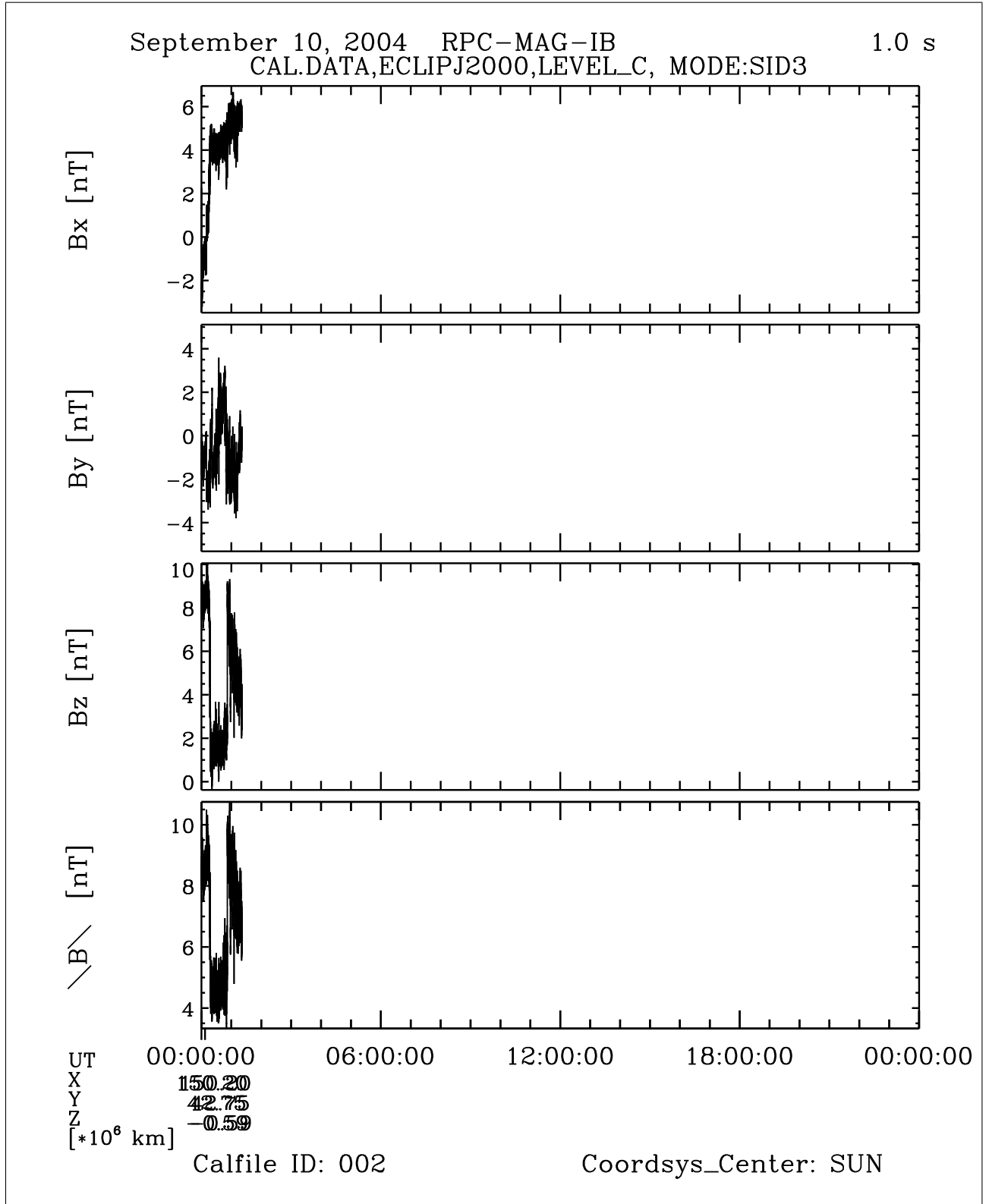


Figure 87: File: RPCMAG040910T0000\_CLC\_IB\_M3\_T0000\_2400\_002

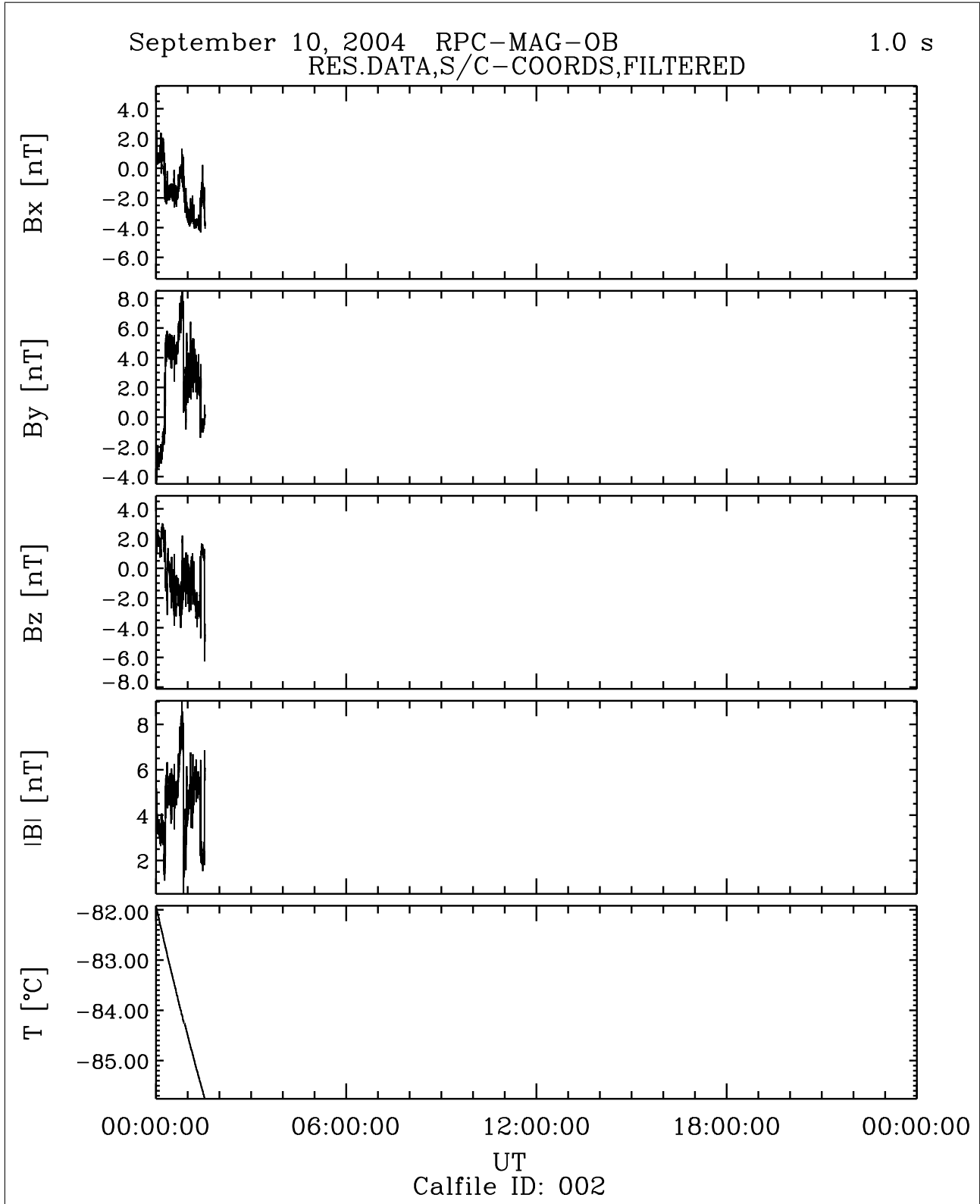


Figure 88: File: RPCMAG040910\_CLF\_OB\_A1\_T0000\_2400\_002

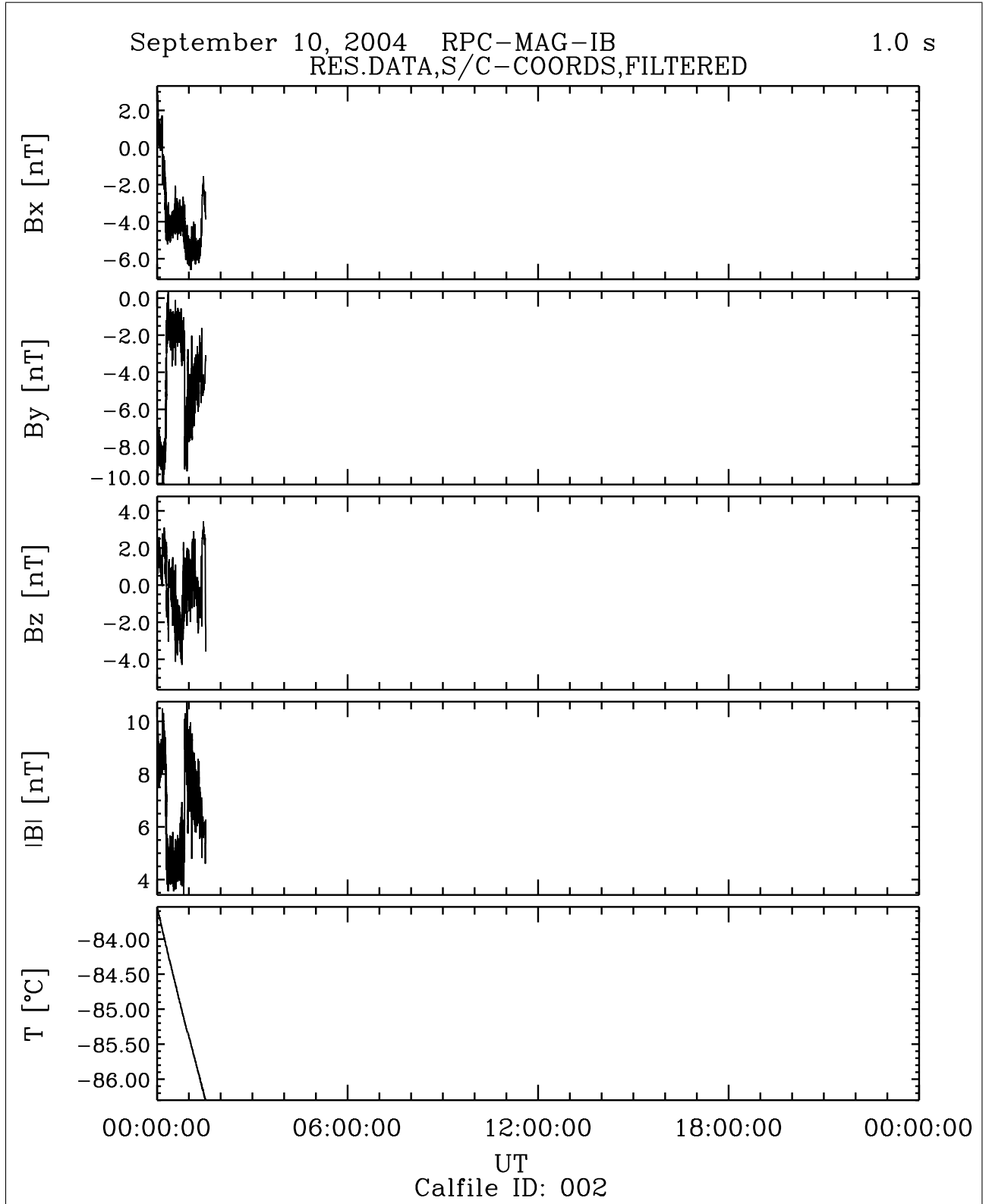


Figure 89: File: RPCMAG040910\_CLF\_IB\_A1\_T0000\_2400\_002

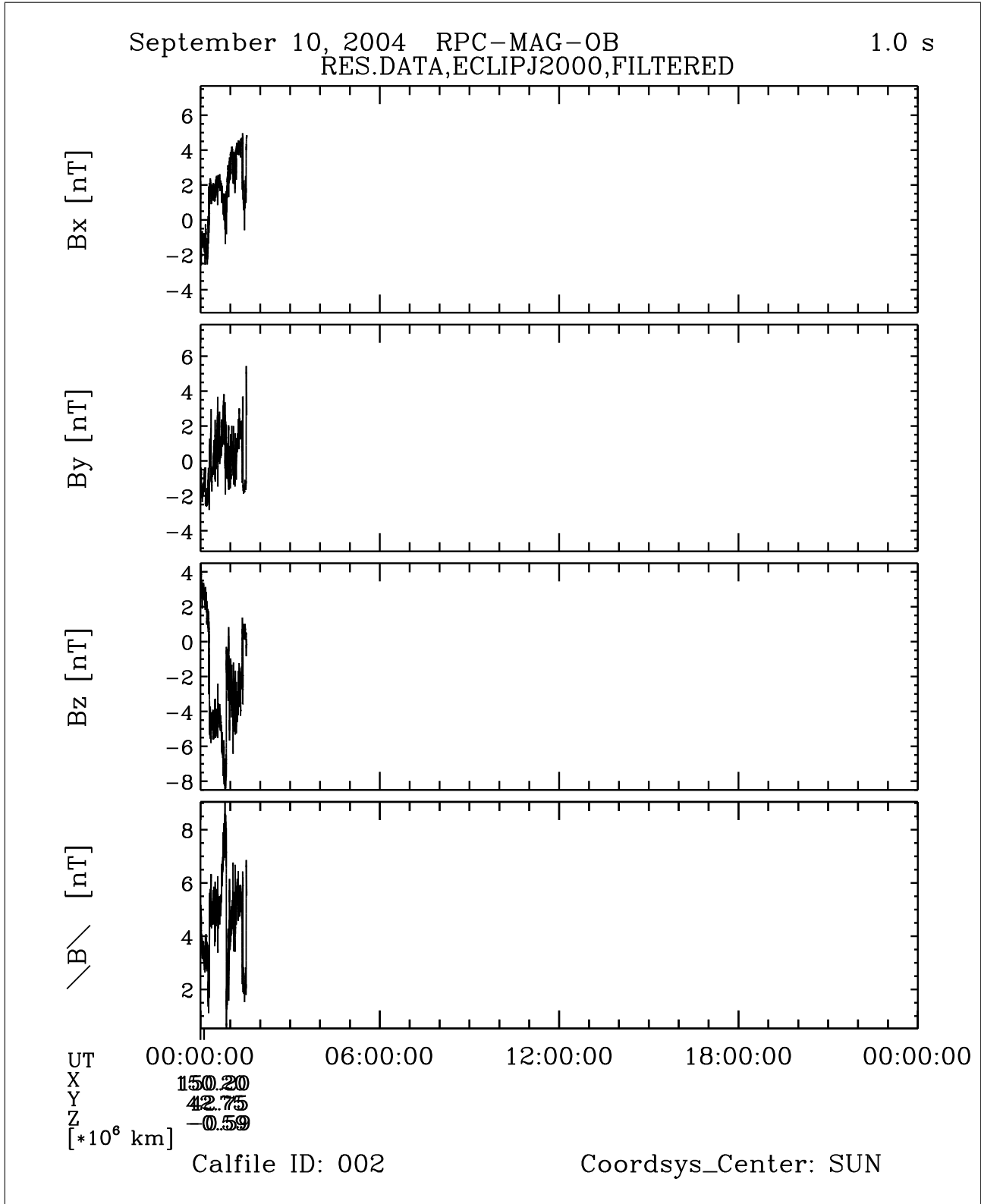


Figure 90: File: RPCMAG040910\_CLG\_OB\_A1.T0000\_2400\_002



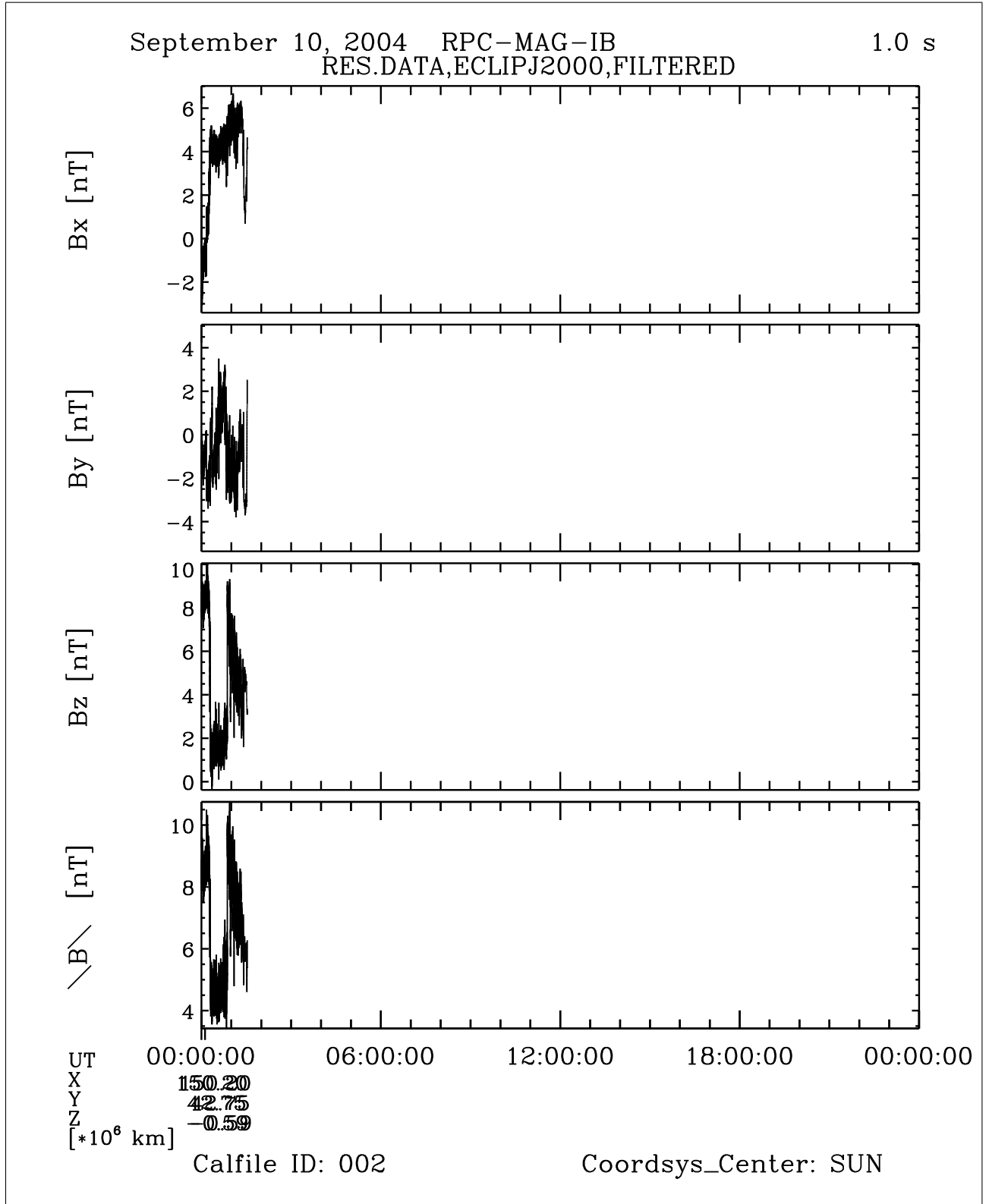


Figure 91: File: RPCMAG040910\_CLG\_IB\_A1\_T0000\_2400\_002

<h1 style="margin: 0;">ROSETTA</h1>	Document: RO-IGEP-TR-0010 Issue: 3 Revision: 2
<b>IGEP</b> Institut für Geophysik u. extraterr. Physik Technische Universität Braunschweig	Date: April 12, 2007 Page: 104

### 6.3 Plots of ROSETTA's Reaction Wheels Speeds

The following plots show the time series of the revolutions of the 4 reaction wheels. Two kinds of data are shown:

- The original reaction wheel data as they are stored in the DDS.
- The theoretical response of the wheels impact seen by an instrument sampling with different frequencies. Here the response in the at 20 Hz and 1 Hz sampling frequency is plotted.

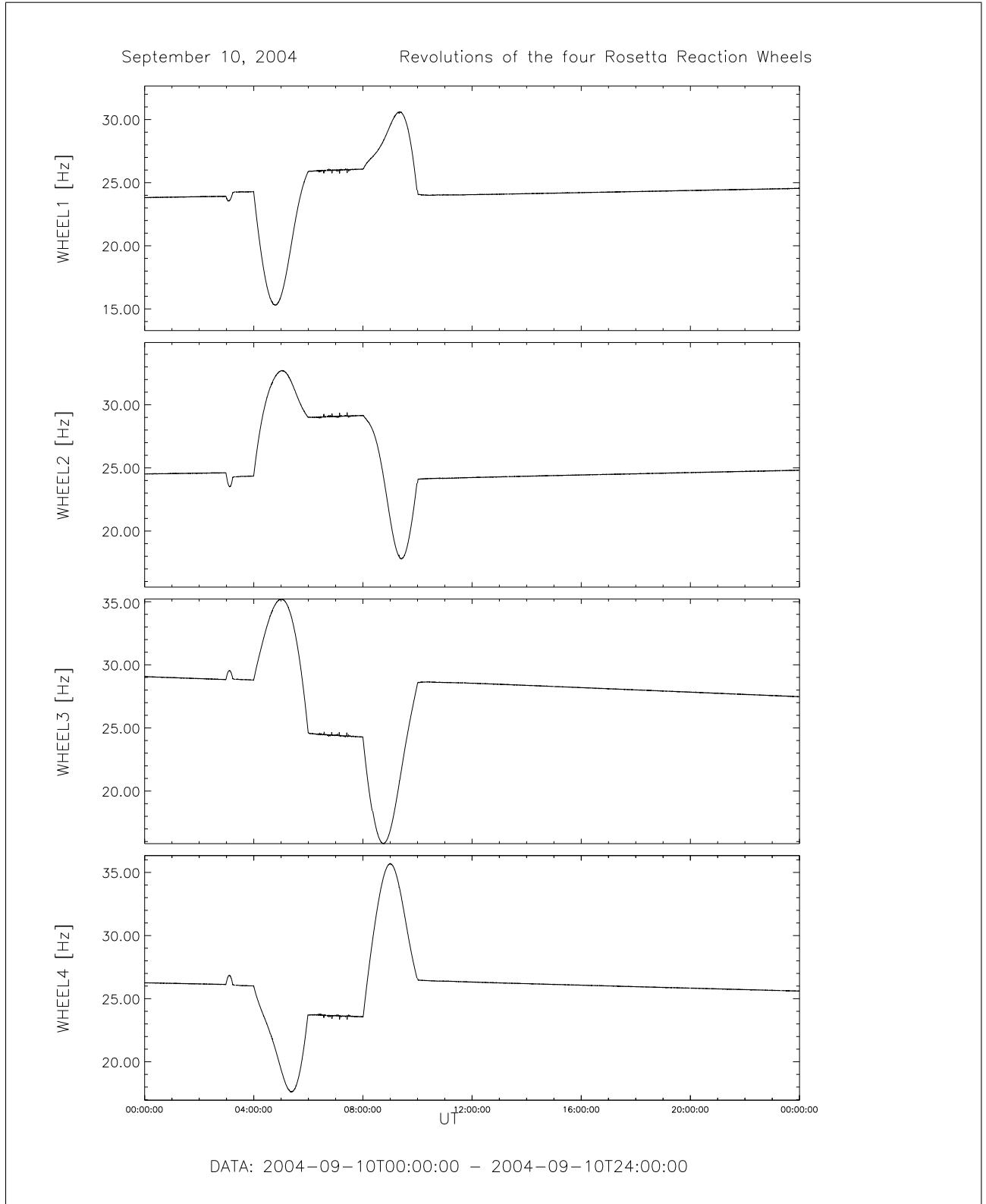


Figure 92: File: wheels\_Hz2004-09-10T00-00

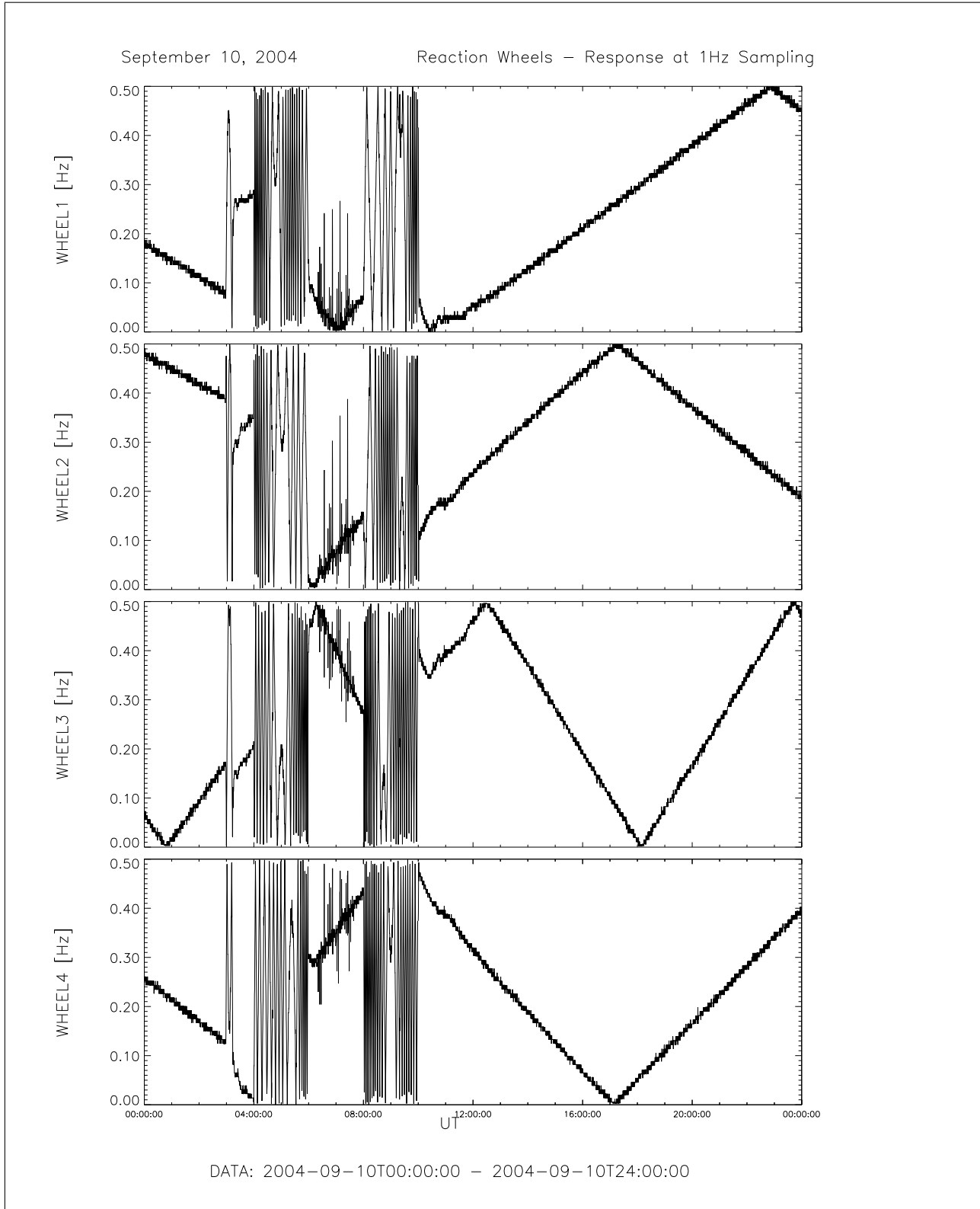


Figure 93: File: wheels\_1Hz\_Sampling2004-09-10T00-00

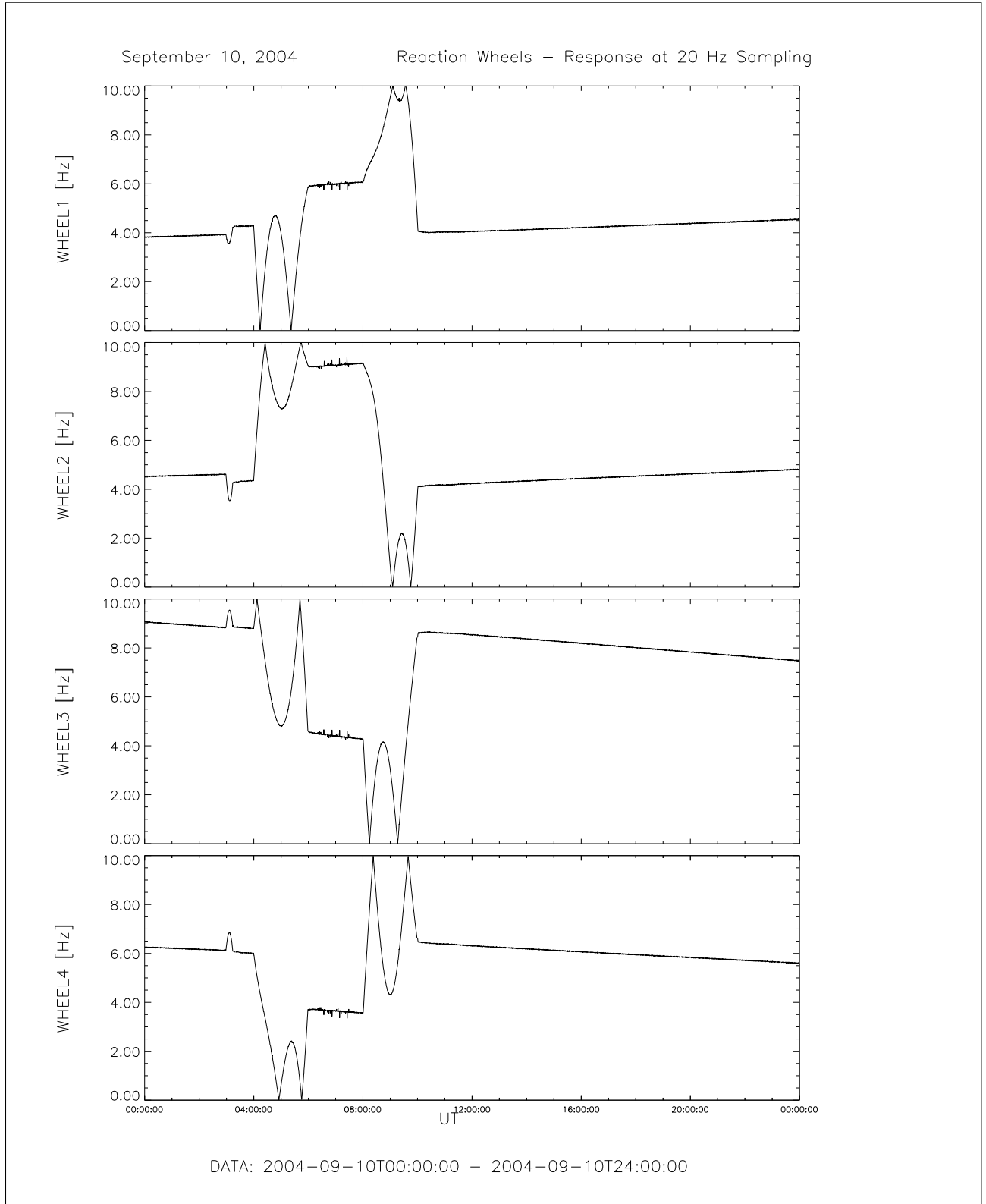


Figure 94: File: wheels\_20Hz\_Sampling2004-09-10T00-00