

HIGH RESOLUTION SPECTROMETER

Ref: CESR-HRS-TR-322-472

Ed. 1

Rev. 0

Date: 25/05/2009

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HRS FM SFT report (SFT performed on 25th of May 2009 from ESOC during CoP)

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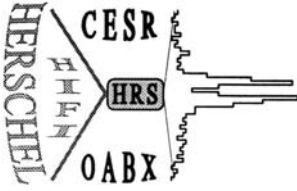
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Configuration Control (CIDL)
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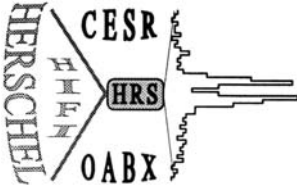


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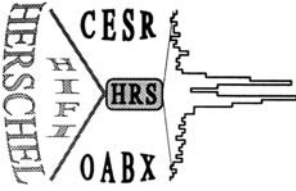
1. INTRODUCTION

1.1. Scope of the document

HIFI has been started for the first time in space the 24th of May 2009. A HRS FT-00 has been successfully done (OBSID 3 at 17h08 UTC). This document presents the analysis of the HRS SFT performed on May 25 during the CoP (from 13h46 to 14h08 UTC).

1.2. Reference Documents (RD)

RD	Title	Ref.
1	HRS Short Functional Tests	CESR-HRS-PR-27-457
2	HRS Functional test procedure	CESR-HRS-PR-323-053



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2. TEMPERATURES

During this test the HRS temperatures were in the correct ranges (see the values in tab. 2).

HRS-H		HRS-V	
HK	Value (°C)	HK	Value (°C)
HRH_ACS_1_T	44.7	HRV_ACS_1_T	32.6
HRH_ACS_2_T	43.5	HRV_ACS_2_T	32.6
HRH_DCDC_1_T	38.8	HRV_DCDC_1_T	28.7
HRH_DCDC_2_T	39.5	HRV_DCDC_2_T	30.6
HRH_IF_1_T	37.6	HRV_IF_1_T	30.0
HRH_IF_2_T	37.4	HRV_IF_2_T	28.6

Tab. 2 : Value of HRS temperature housekeepings during the SFT

3. TEST RESULTS

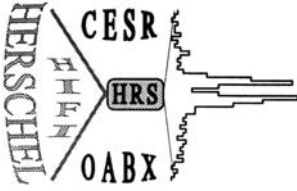
3.1. Results summary

OBSID	TEST	HRS-H	HRS-V
22	Testmode_HRS_functional_test_No_1	OK	OK
22	Testmode_HRS_functional_test_No_2_Square_s	OK	OK
22	Testmode_HRS_functional_test_No_2_Square_m	OK	OK
22	Testmode_HRS_functional_test_No_2_Sine	OK	OK
22	Testmode_HRS_functional_test_No_2_Corr	OK	OK
22	Testmode_HRS_functional_test_No_4	OK	OK
22	Testmode_HRS_functional_test_Linearity	OK	OK
22	Testmode_HRS_polar_switch	OK	OK

Tab. 3.1: List of tests performed on the HRS

From the SFT results we conclude that the HRS (H and V) are healthy.

Some details are presented hereafter.



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3.2. Correlator test (FT-02)

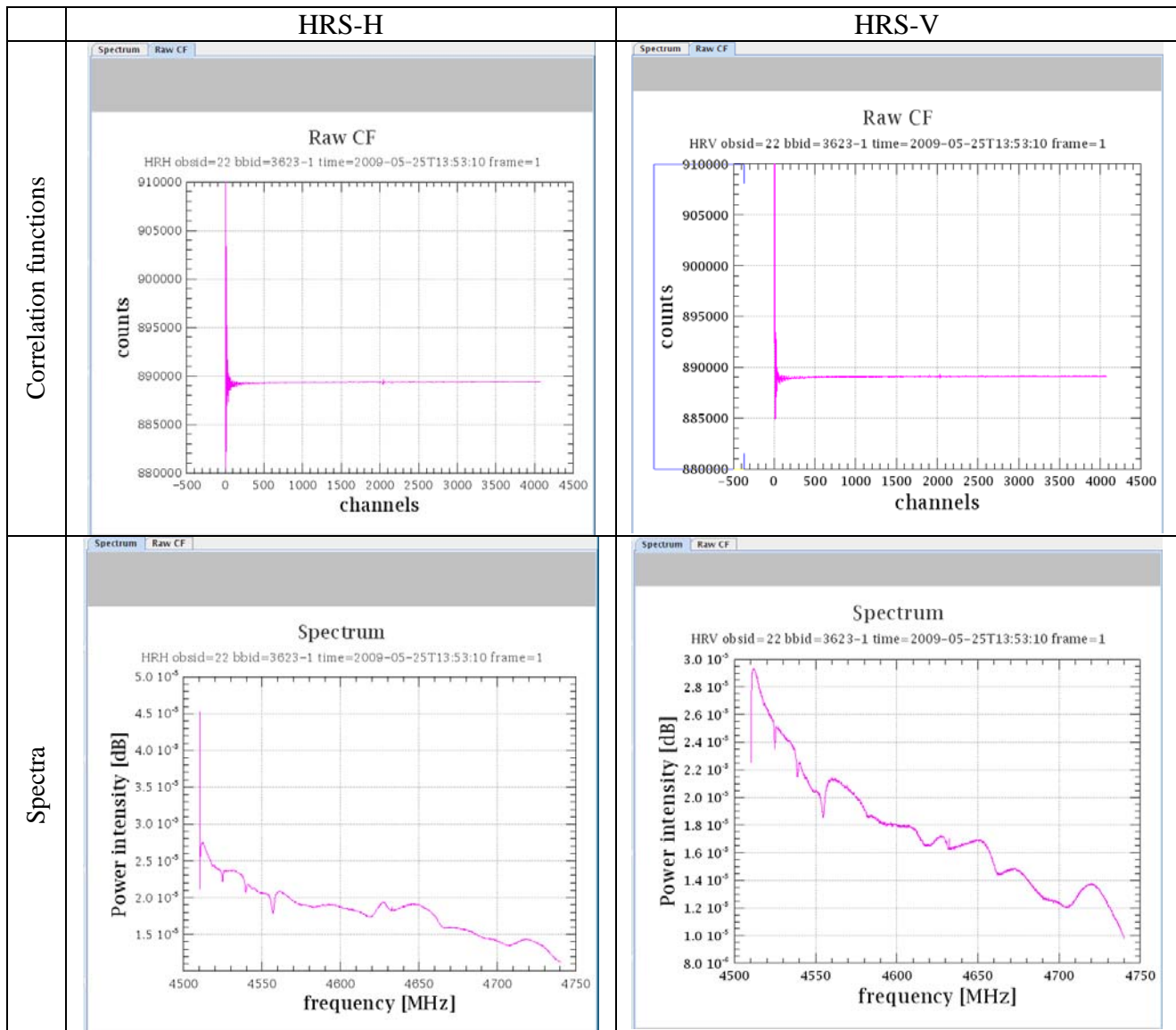
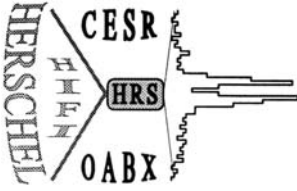


Fig. 3.2: Result of correlator test with noise at input. The results are as expected.



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3.3. Efficiency

The FT-02 includes some measurements in "noise" mode. From these measurements we make an estimation of the HRS efficiency. This measurement is not accurate because it is done on 2 spectra of 500 channels only (wide band mode). A measurement has also been done in high resolution mode in order to have a better precision but this characterises only one sub-band. This high resolution result is annotated in the plots.

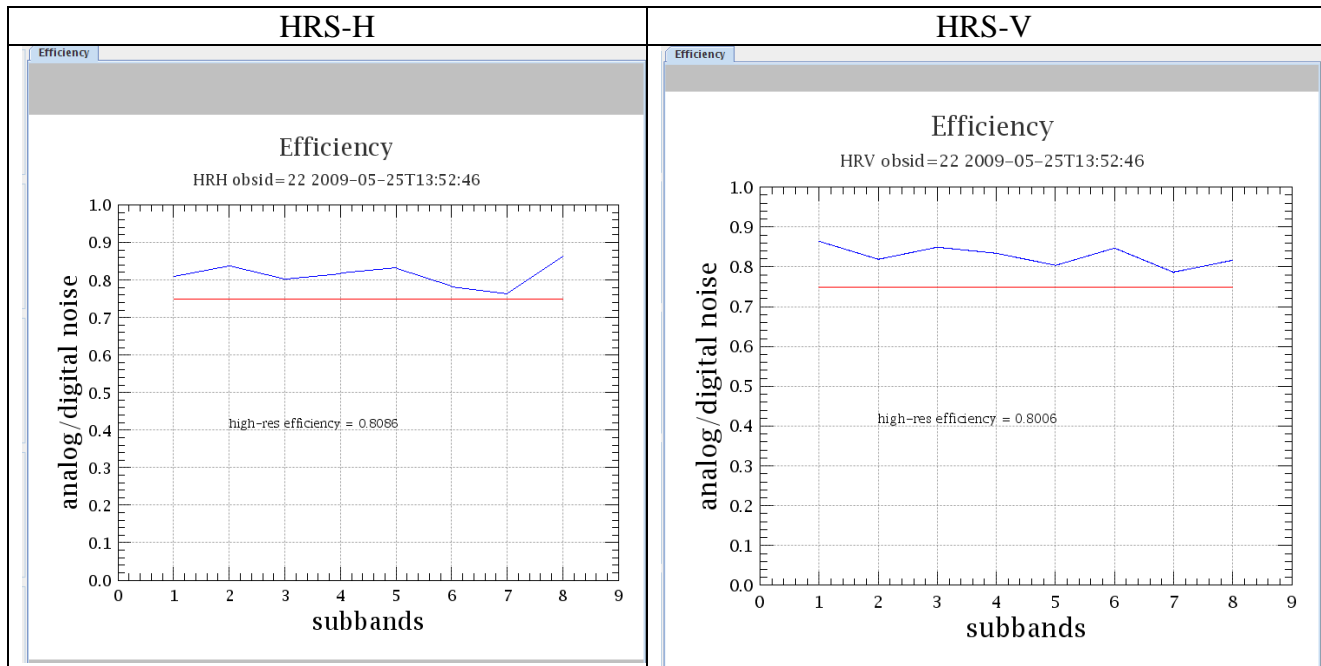
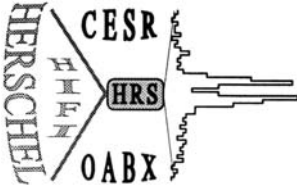


Fig. 3.3: Result of efficiency measurements with noise at input. The results are as expected.



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3.4. Attenuator settings (FT-04)

The result of this functional test is presented on fig. 3.4.

- The power in HRS sub-bands 4 and 5 (at highest frequencies) is smaller than in the others. This is probably due to the input band shape.

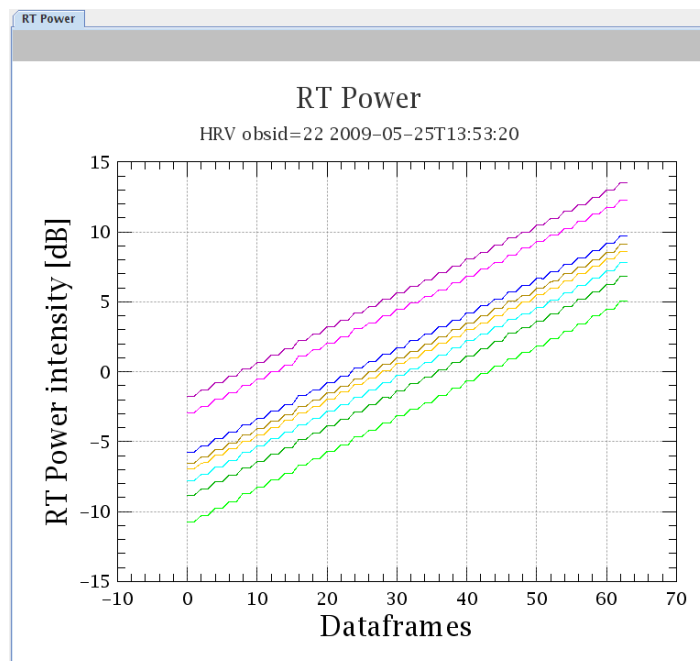
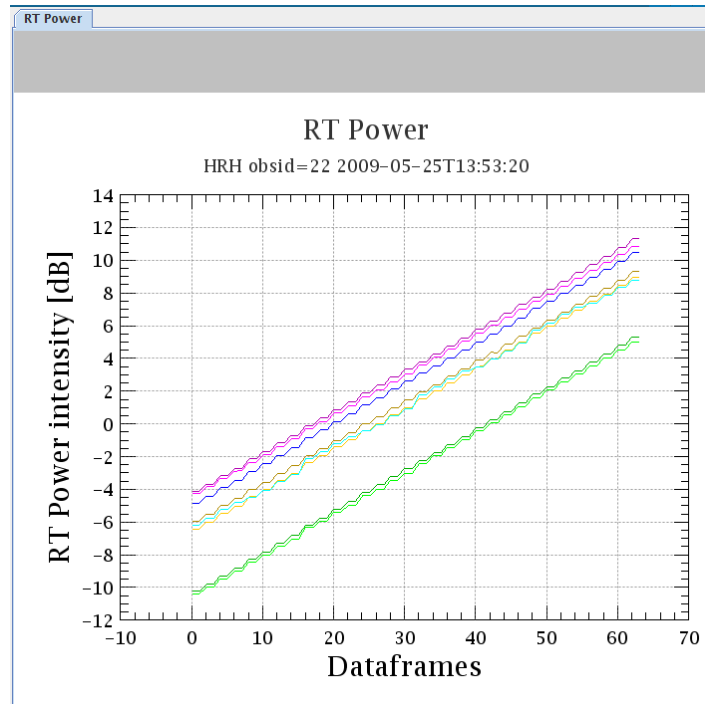
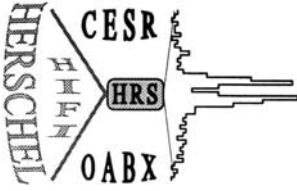


Fig. 3.4: FT-04 result for HRS-H (up) and HRS-V (bottom)



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3.5. Linearity test

The result is as expected.

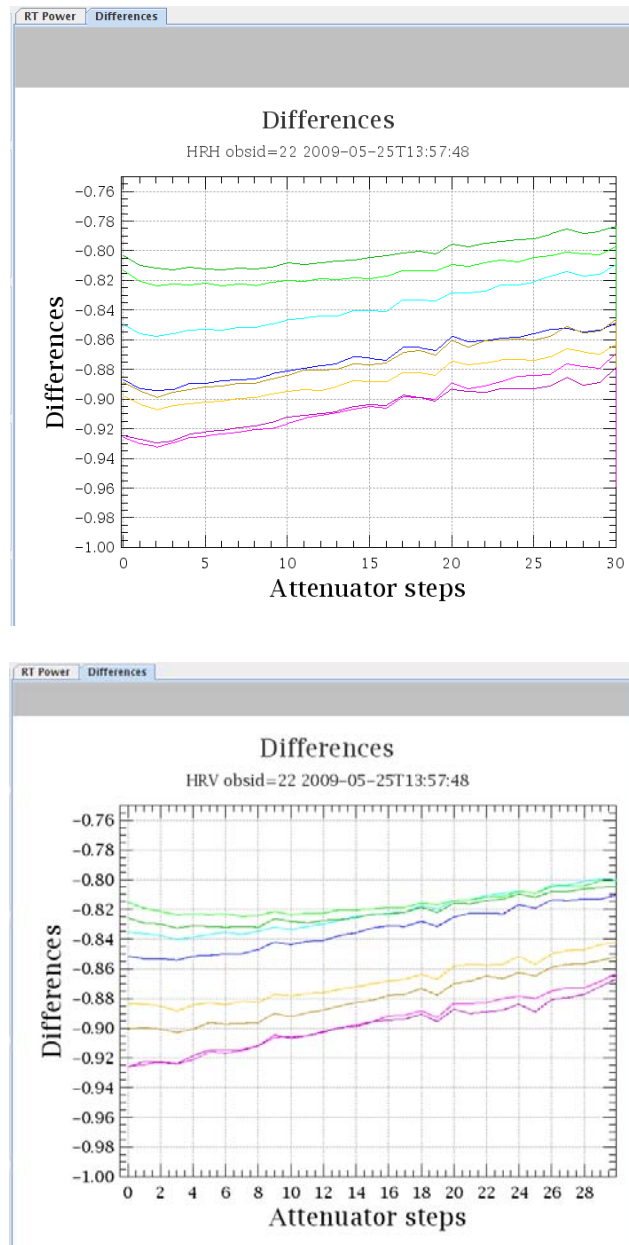
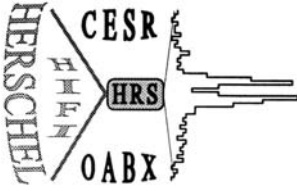


Fig. 3.5: Result for HRS-H (up) and HRS-V (bottom)



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3.6. HRS-H / HRS-V cross test

This test checks the cross connection between the two HRS-es. The test sequence is the following:

Step	Mode	HRH input	HRV input	Comment
1	Attenuator tuning	H	V	No cross connection
2	IFlow	H	V	No cross connection
3	IFhigh	H	V	No cross connection
4	Attenuator tuning	H	H	Cross connection H > V
5	IFlow	H	H	Cross connection H > V
6	IFhigh	H	H	Cross connection H > V
7	Attenuator tuning	V	V	Cross connection V > H
8	IFlow	V	V	Cross connection V > H
9	IFhigh	V	V	Cross connection V > H

Tab. 3.6-a: Test sequence

During this test the "IFlow" data frames were lost due to a problem with the propagation of the commands. This is not a limitation for this test.

The maximum variation of the attenuators setting is 2.0 dB only when the switch configuration changes (see table 3.6-b).

From this test we conclude that the HRS-es are properly cross-connected and that the loss in the cables is correctly compensated.

Step	HRH attenuator settings								HRV attenuator settings							
	N	O		D	A	T	A		N	O		D	A	T	A	
2	N	O		D	A	T	A		N	O		D	A	T	A	
3	13.5	14.0	11.5	12.0	11.5	13.0	7.5	7.5	15.0	15.5	11.0	11.5	10.0	12.0	7.0	9.0
5	N	O		D	A	T	A		N	O		D	A	T	A	
6	13.5	14.0	11.5	12.0	11.5	13.0	7.5	7.5	15.5	15.5	11.5	12.0	10.0	12.5	6.5	7.5
8	N	O		D	A	T	A		N	O		D	A	T	A	
9	15.5	15.5	12.0	13.0	12.0	13.5	8.5	9.5	15.0	15.5	11.0	11.5	10.0	12.0	7.0	9.0
Δ	2.0	1.5	0.5	1.0	0.5	0.5	1.0	2.0	0.5	0.0	0.5	0.5	0.0	0.5	0.5	1.5

Tab. 3.6-b: Attenuator settings along the cross connected test