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MARSIS MELACOM, Compatibility Test

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1 INTRODUCTION

The purposes of this document is to provide a brief description of the activities performed by MARSIS and MELACOM, during the last test campaign, in order to detect eventually interferences.



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2 TEST 1: MARSIS INTERFERENCE ON MELACOM

2.1 MARSIS/MELACOM Timelines Overview

Orbit 4656. Pericenter data: 19 – August -07. T 09:59:14 [UTC]

MI Op Mode	OST	MI Status	MEL Status	Start [UTC]	End [UTC]	Duration	MI Pointing	Notes
Orbit 4656								
STBY		Stby	Canister	9.23.00	9.27.00	4m0s		
PREO		Stby	Canister	9.27.00	9.29.00	2m0s		
AIS	0	Active/ Max Power	Canister	9.29.00	9.31.00	2m0s	Nadir	Test
Slow Power Up Seq	1,2	Active/low Tx Power	Canister	9.31.00	9.31.30	0m30	Nadir	
SS3 (B1/B1)	3	Active/ Max Power	Canister	9.31.30	9.33.30	2m0s	Nadir	Test
SS3 (B2/B2)	4	Active/ Max Power	Canister	9.33.30	9.35.30	2m0s	Nadir	Test
SS3 (B3/B3)	5	Active/ Max Power	Canister	9.35.30	9.37.30	2m0s	Nadir	Test
SS3 (B4/B4)	6	Active/ Max Power	Canister	9.37.30	9.39.30	2m0s	Nadir	Test
AIS Preparation	7	Active/ Max Power	Canister	9.39.30	9.39.45	0m15s	Nadir	
AIS	8	Active/ Max Power	Canister	9.39.45	9.46.00	6m15s	Nadir	Test
AIS	8	Active/ Max Power	Canister	9.46.00	9.50.00	4m0s	Nadir	Test
AIS	8	Active/ Max Power		9.50.00	10.19.14	29m14s		
POST		Stby		10.19.14	10.21.14	2m0s		

2.2 MARSIS Science Results

For the test performed in orbit 4656 it was not possible to include any science result, since the spacecraft was too far from Mars to allow any science observations



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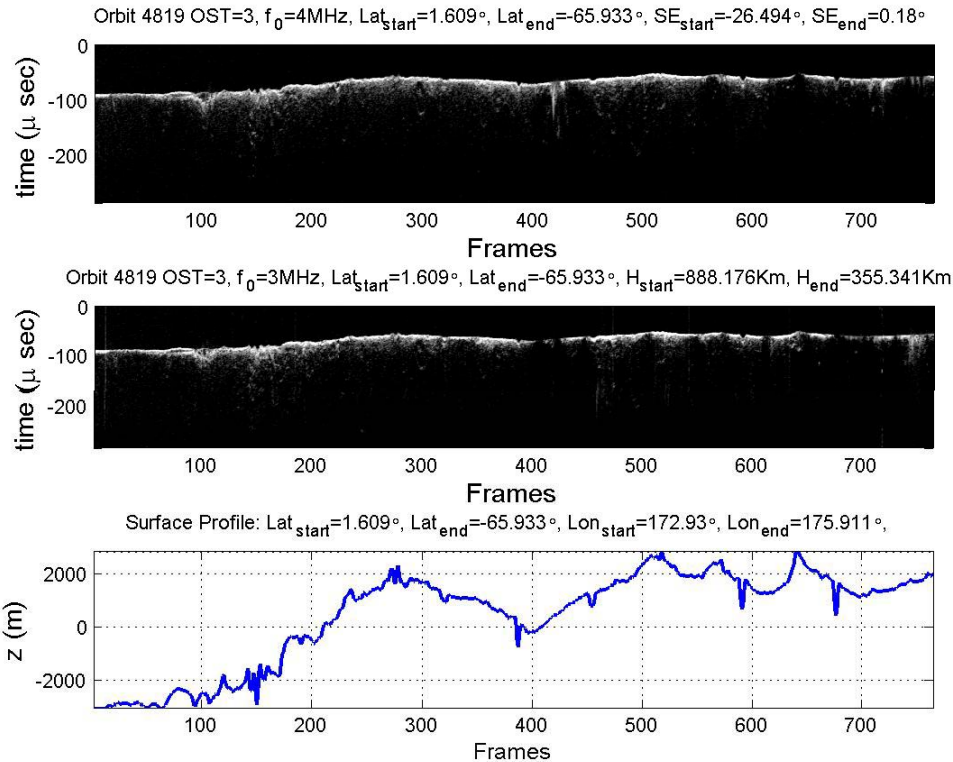
3 TEST 2: MELACOM INTERFERENCE ON MARSIS

3.1 MARSIS/MELACOM Timelines Overview

Orbit 4819. Pericenter data: 04 – October -07. T 01:21:15 [UTC]

MI Op Mode	OST	MI Status	MEL Status	Start [UTC]	End [UTC]	Duration	MI Pointning	Notes
Orbit 4819								
STBY		Stby	ON	0.54.15	0.58.15	4m0s		
PREO		Stby	COMM	0.58.15	1.01.15	3m0s		15s delta
AIS	0	Active/ Max Power	COMM	1.01.15	1.06.15	5m0s	Nadir	MER-A
Slow Power Up Seq	1,2	Active/low Tx Power	COMM	1.06.15	1.06.45	0m30	Nadir	
SS3 (B3/B2)	3	Active/ Max Power	COMM	1.06.45	1.17.00	10m15s	Nadir	MER-A
SS3 (B3/B2)	3	Active/ Max Power	ON	1.17.00	1.25.15	8m15	Nadir	15s delta
SS3 (B4/B3)	4	Active/ Max Power		1.25.15	1.36.00	10m45s	Nadir	
AIS Preparation	5	Active/ Max Power		1.36.00	1.36.15	0m15s	Nadir	
AIS	6	Active/ Max Power		1.36.15	1.41.15	5m0s	Nadir	
POST		Stby		1.41.15	1.43.15	2m0s		

3.2 MARSIS Science Results





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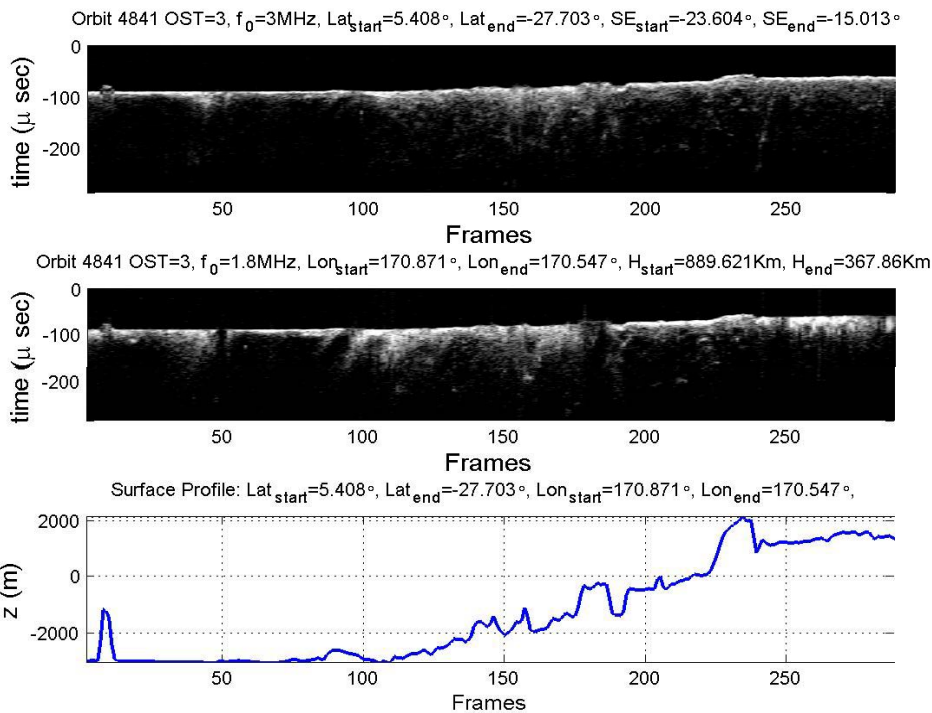
4 TEST 3: MELACOM INTERFERENCE ON MARSIS

4.1 MARSIS/MELACOM Timelines Overview

Orbit 4841. Pericenter data: 10 – October -07. T 05:11:14 [UTC]

MI Op Mode	OST	MI Status	MEL Status	Start [UTC]	End [UTC]	Duration	MI Pointning	Notes
Orbit 4841								
STBY		Stby	ON	4.44.14	4.48.14	4m0s		
PREO		Stby	ON	4.48.14	4.51.14	3m0s		14s delta
AIS	0	Active/ Max Power	COMM	4.51.14	4.56.14	5m0s	Nadir	MER-A
Slow Power Up Seq	1,2	Active/low Tx Power	COMM	4.56.14	4.56.44	0m30	Nadir	
SS3 (B2/B1)	3	Active/ Max Power	COMM	4.56.44	5.06.29	9m45s	Nadir	MER-A
SS3 (B3/B2)	4	Active/ Max Power	COMM	5.06.29	5.08.00	1m31s	Nadir	MER-A
SS3 (B3/B2)	4	Active/ Max Power	ON	5.08.00	5.13.30	5m30s	Nadir	
SS3 (B3/B2)	4	Active/ Max Power		5.13.30	5.16.14	2m44s	Nadir	
SS3 (B4/B3)	5	Active/ Max Power		5.16.14	5.25.59	9m45s	Nadir	
AIS Preparation	6	Active/ Max Power		5.25.59	5.26.14	0m15s	Nadir	
AIS		Active/ Max Power		5.26.14	5.31.14	5m0s	Nadir	
POST		Stby		5.31.14	5.33.14	2m0s		

4.2 MARSIS Science Results





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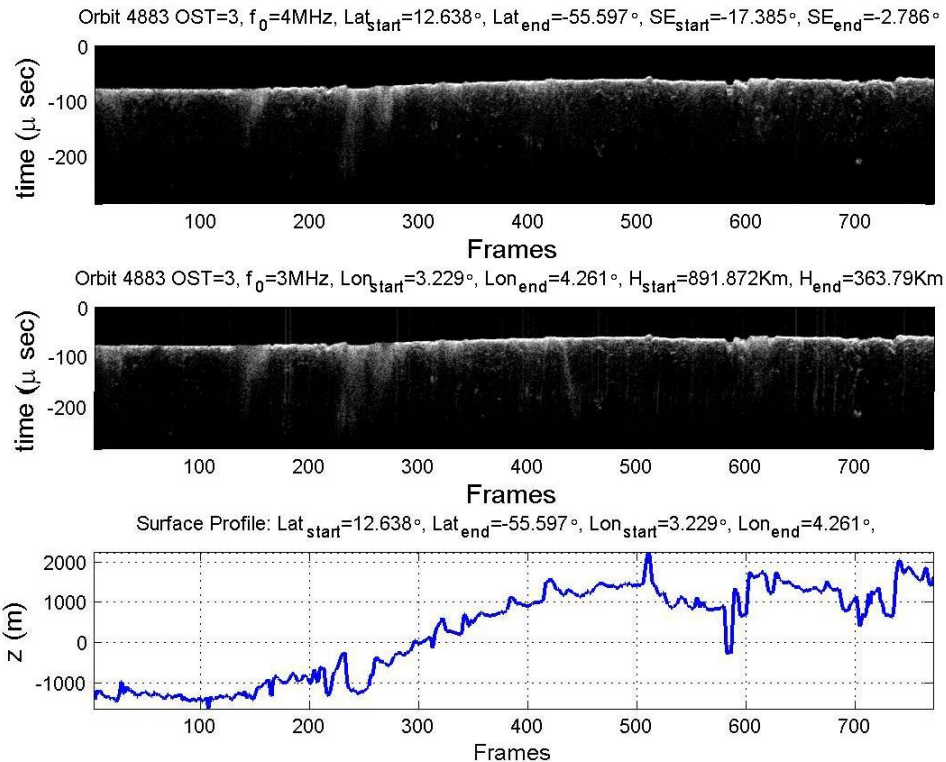
5 TEST 5: MELACOM INTERFERENCE ON MARSIS

5.1 MARSIS/MELACOM Timelines Overview

Orbit 4883. Pericenter data: 21 – October -07. T 23:25:06 [UTC]

MI Op Mode	OST	MI Status	MEL Status	Start [UTC]	End [UTC]	Duration	MI Pointning	Notes
Orbit 4883								
STBY		Stby	ON	22.58.06	23.02.06	4m0s		5sec
PREO		Stby	COMM	23.02.06	23.05.06	3m0s		
AIS	0	Active/ Max Power	COMM	23.05.06	23.10.06	5m0s	Nadir	MER-B
Slow Power Up Seq	1,2	Active/low Tx Power	COMM	23.10.06	23.10.36	0m30	Nadir	
SS3 (B3/B2)	3	Active/ Max Power	COMM	23.10.36	23.20.01	9m25s	Nadir	MER-B
SS3 (B3/B2)	3	Active/ Max Power	ON	23.20.01	23.31.51	11m50s	Nadir	6m50
SS3 (B4/B3)	4	Active/ Max Power		23.31.51	23.39.51	8m0s	Nadir	
AIS Preparation	5	Active/ Max Power		23.39.51	23.40.06	0m15s	Nadir	
AIS	6	Active/ Max Power		23.40.06	23.45.06	5m0s	Nadir	
POST		Stby		23.45.06	23.47.06	2m0s		

5.2 Timelines Overview





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6 CONCLUSIONS

None of the test performed (MELACOM on MARSIS) revealed any significant EMI or anomaly in the Subsurface Sounding and AIS modes.

We attribute the partial degradation of the SNR level and sometimes of the Spatial Resolution to the variability in the surface roughness and the local plasma density, of the upper ionosphere layers.

In conclusion, the activities performed by MELACOM during this test campaign do not seem to have any significant impact on the MARSIS Science data quality.

MARIS concurs with the removal of the exclusion on parallel MARSIS and MELACOM operations.