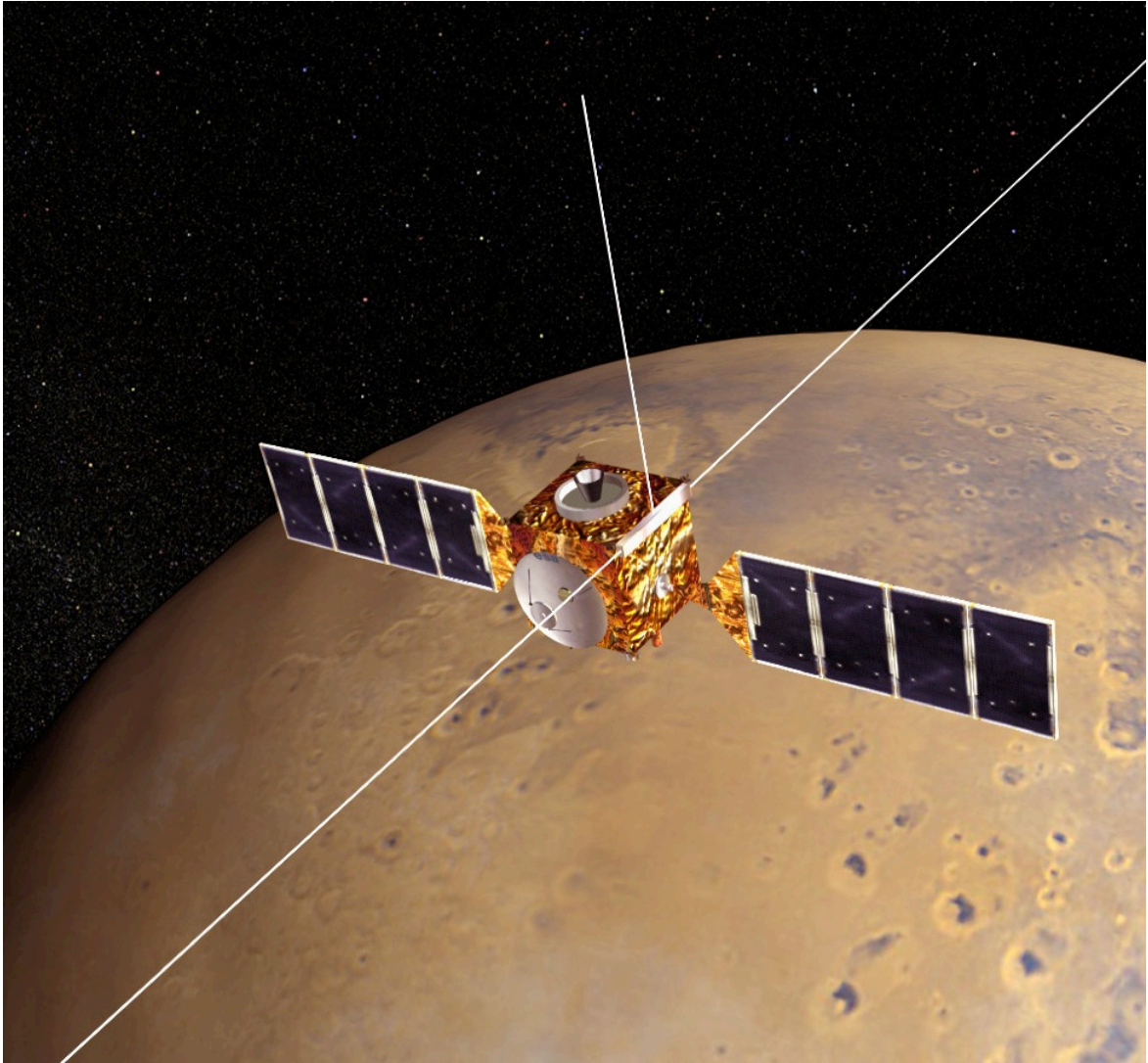


# Introduction to MARSIS

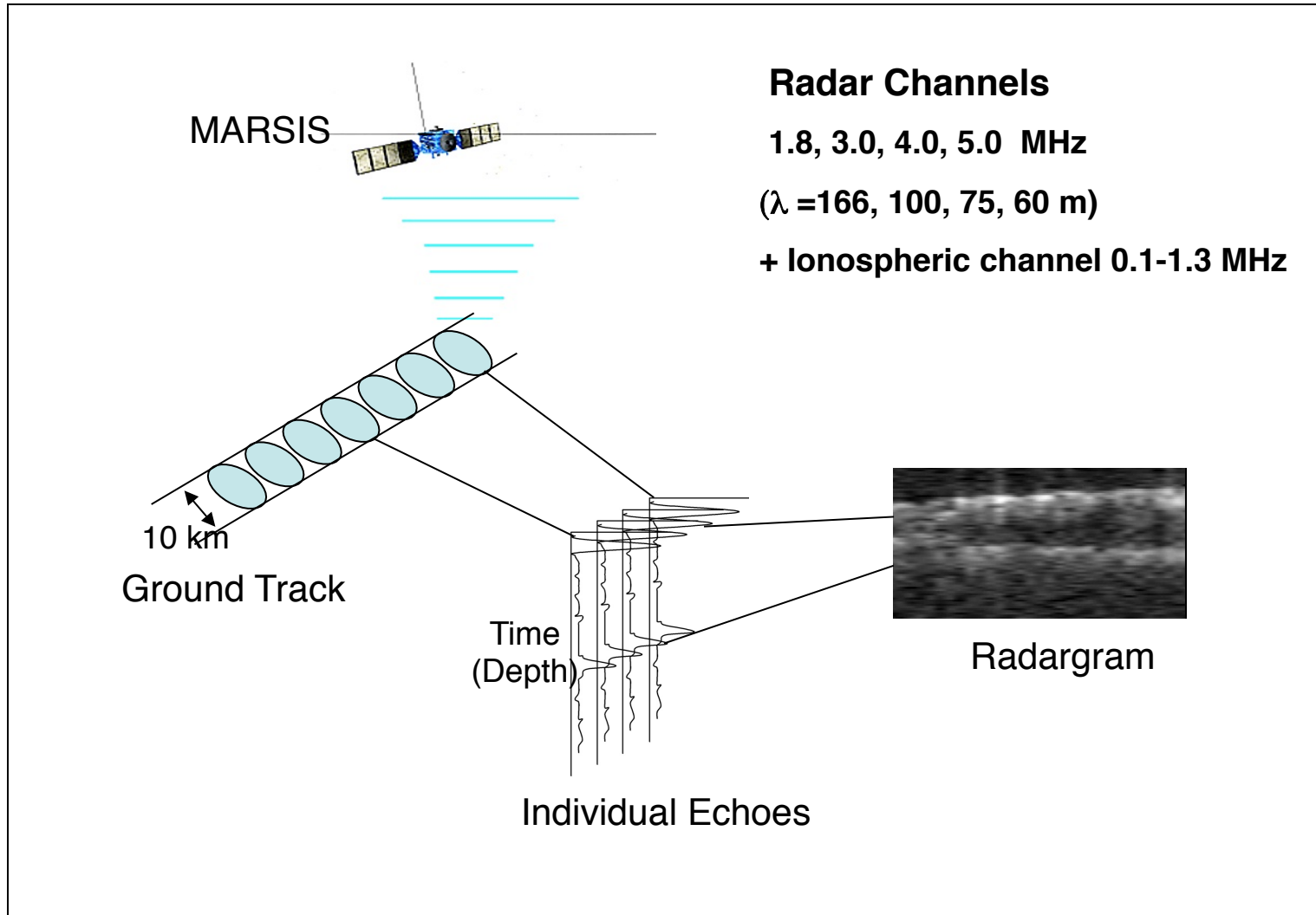
Jeffrey Plaut  
JPL-Caltech

SHARAD/MARSIS Data Users' Workshop  
16 March 2014

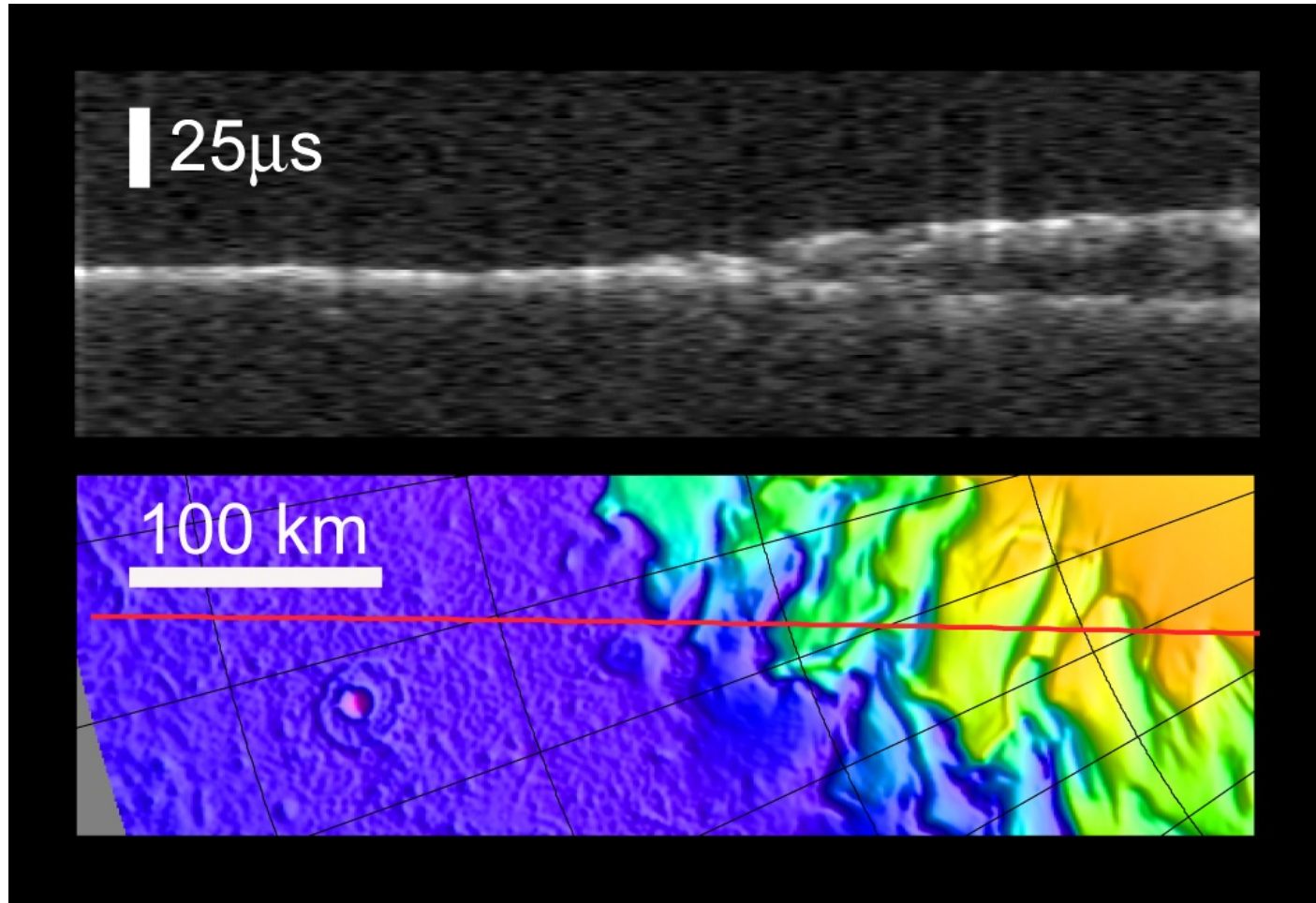
# MARSIS Deployed on Mars Express



# MARSIS Data Collection

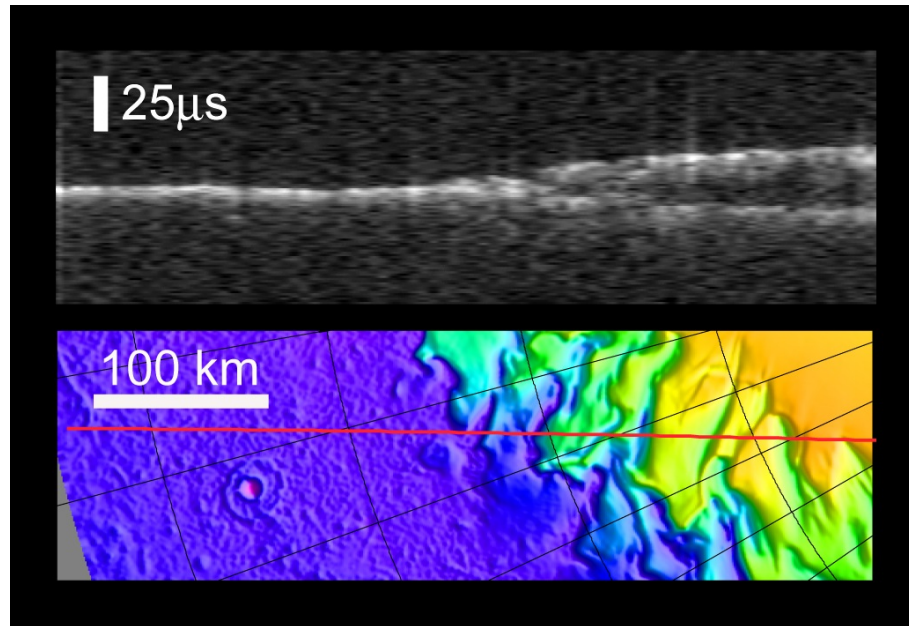


# MARSIS - North Polar Layered Deposits

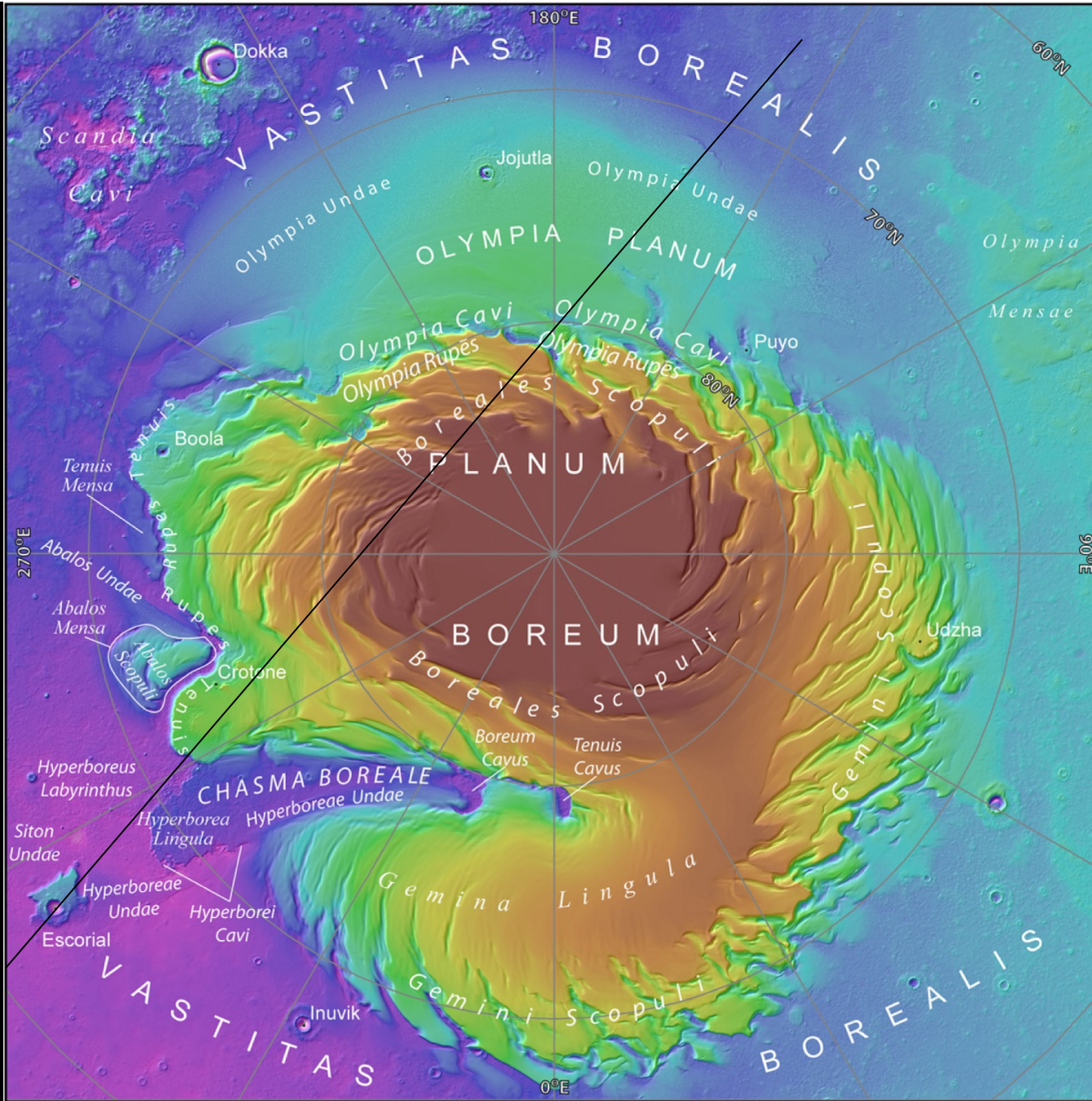




# MARSIS - North Polar Layered Deposits



- Lower reflector depth = 1.8 km in ice.
- Low attenuation requires clean ice (< 2% impurities).
- No evidence for basal melt zone.
- No detected deflection from load --> large elastic thickness.



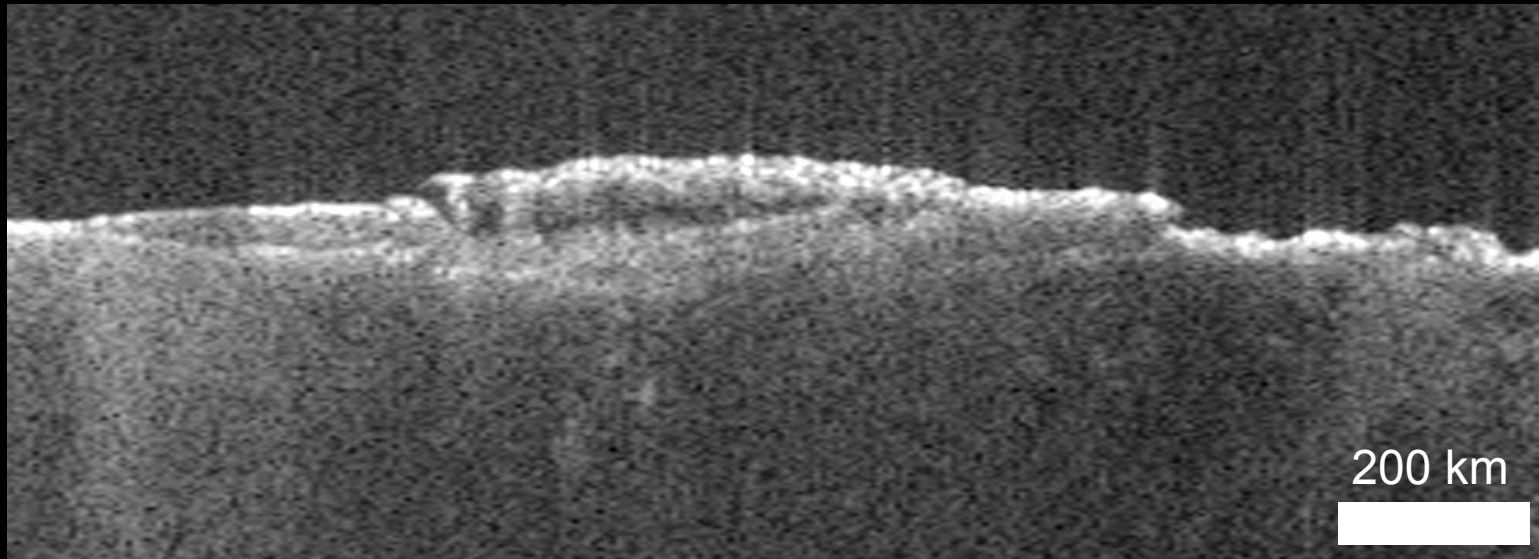
-6700 Elevation (m) -2200



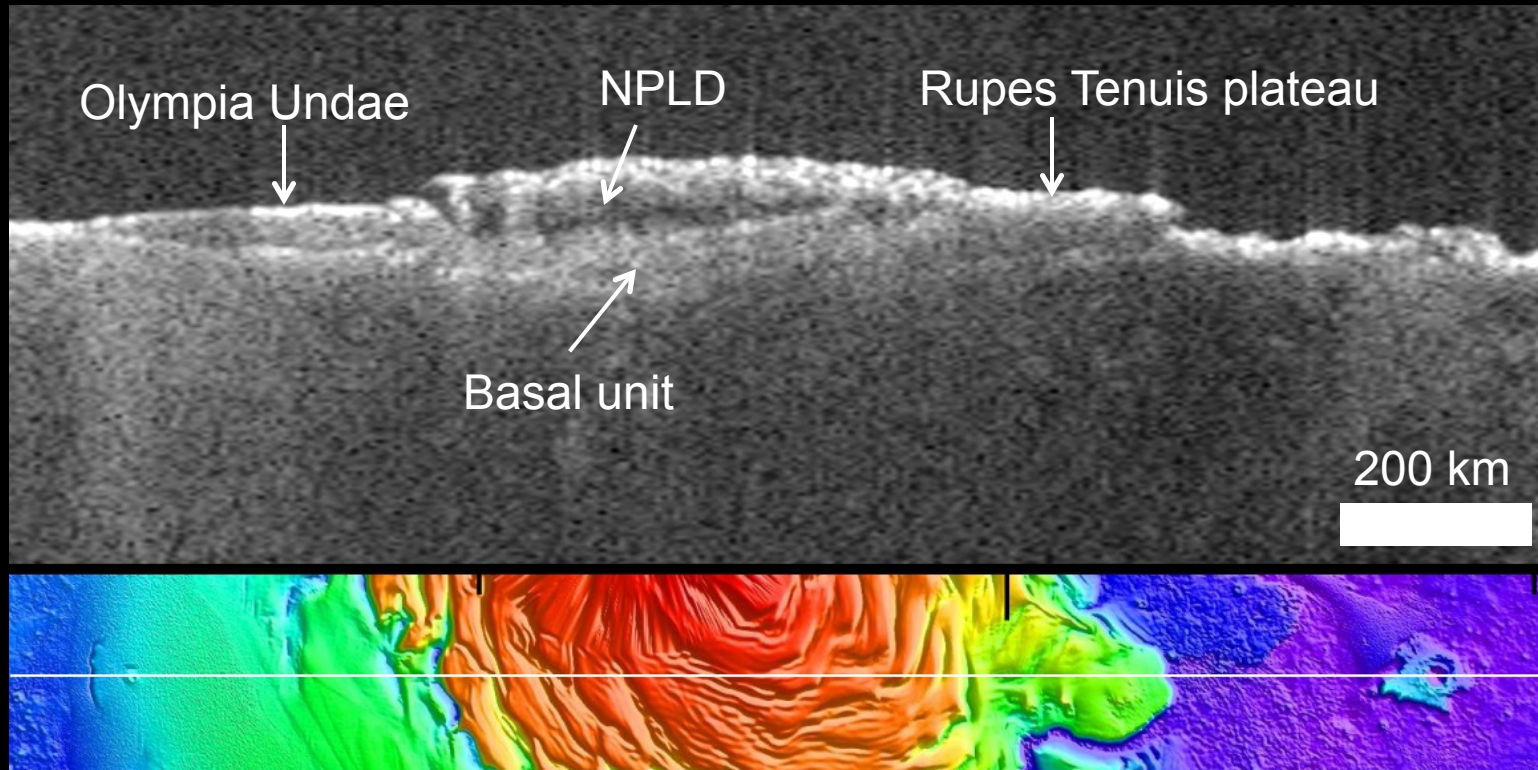
0 Scale (km) 500





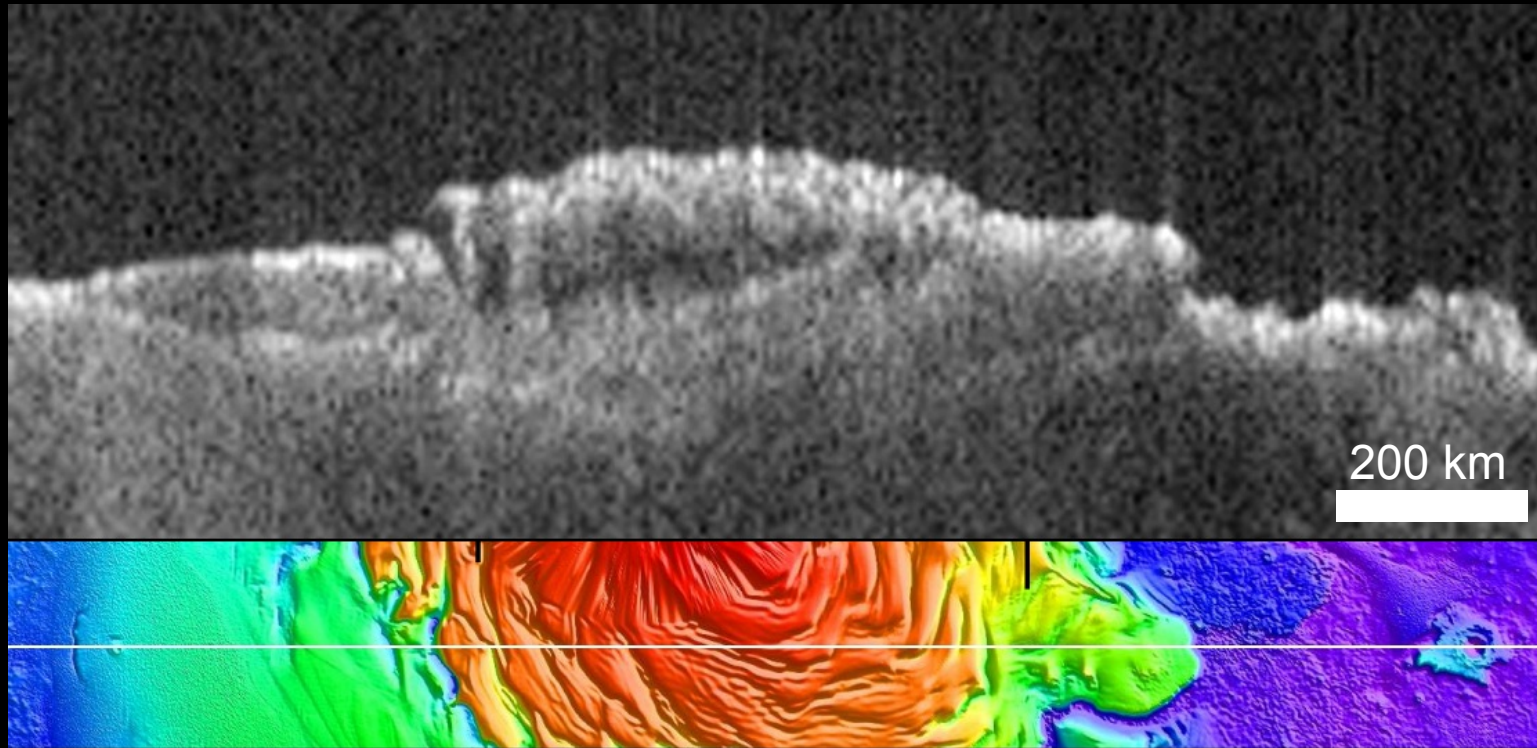


Orbit 9548 – June 2011



Orbit 9548 – June 2011

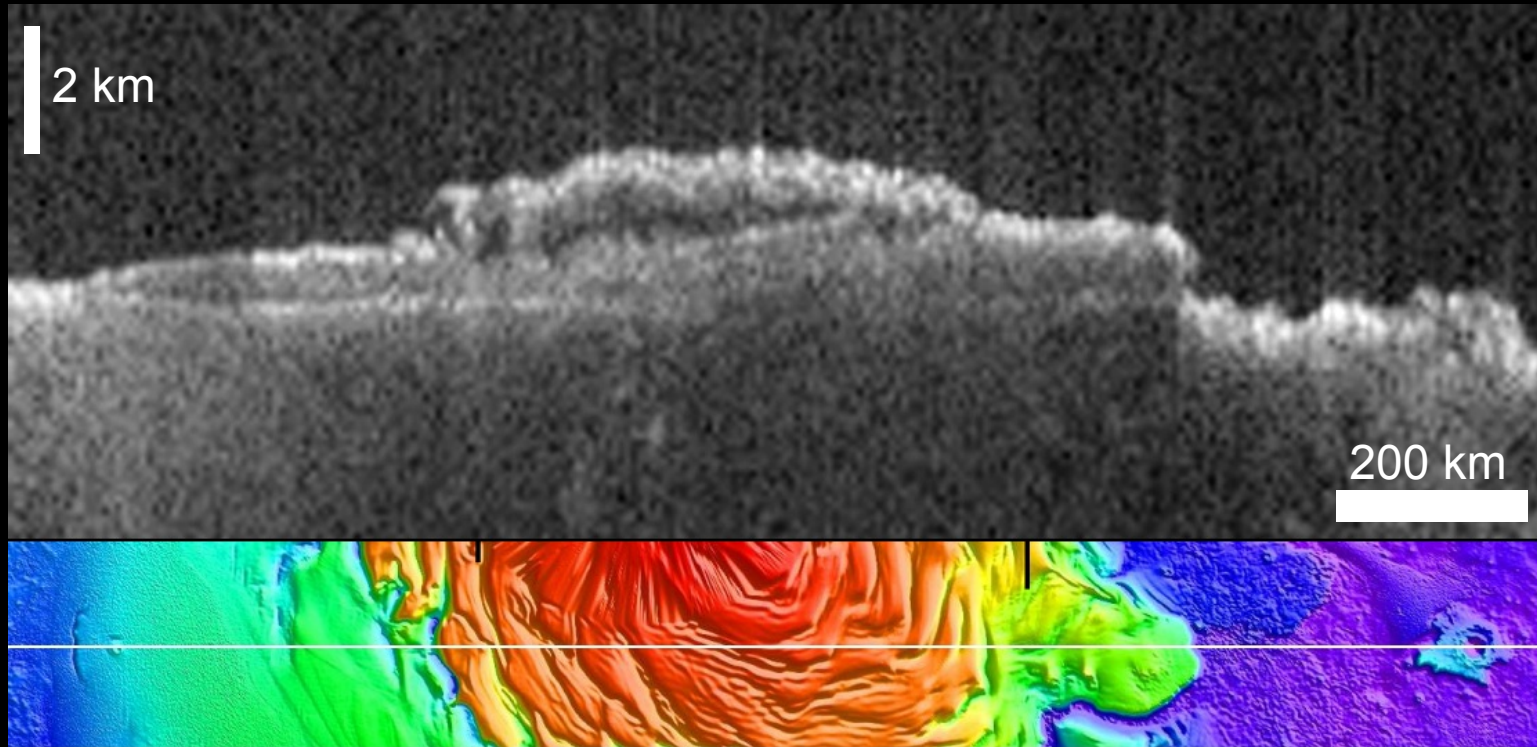
# Time Delay



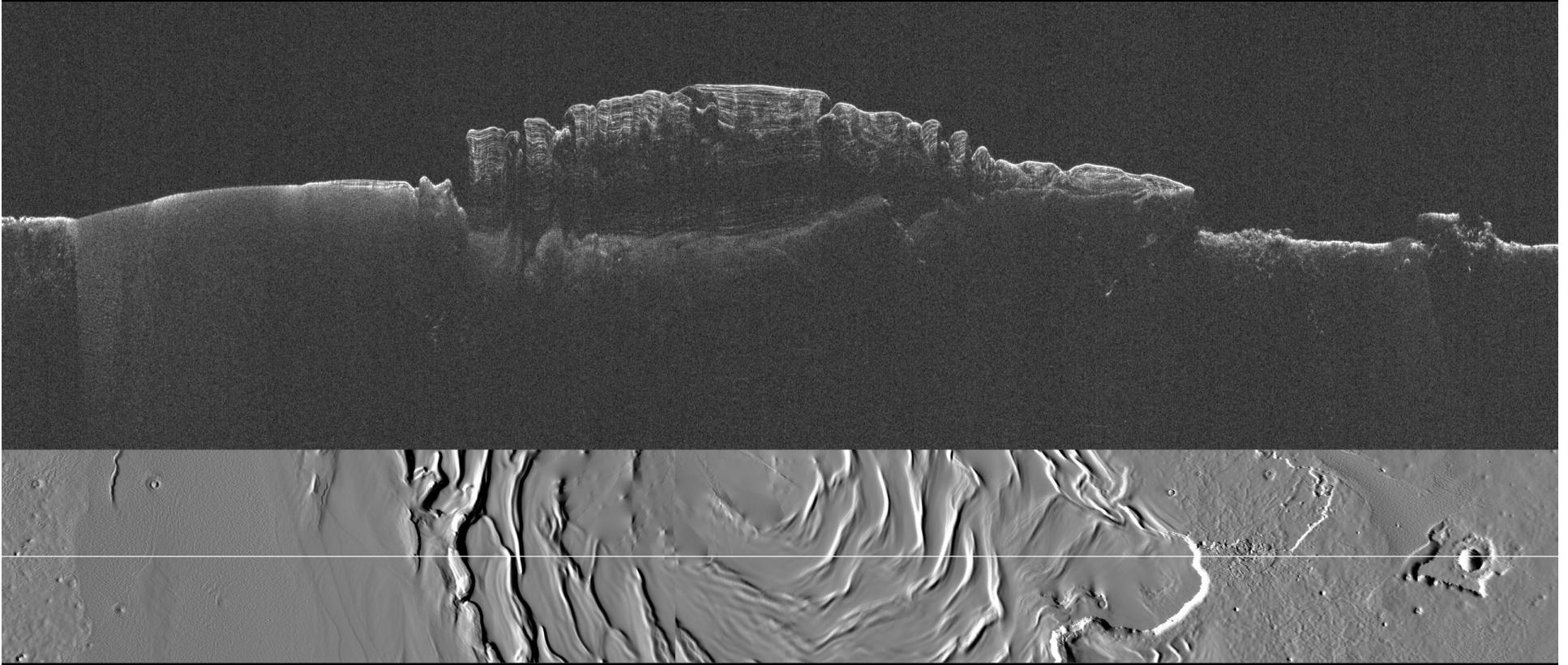
Orbit 9548 – June 2011



# Depth

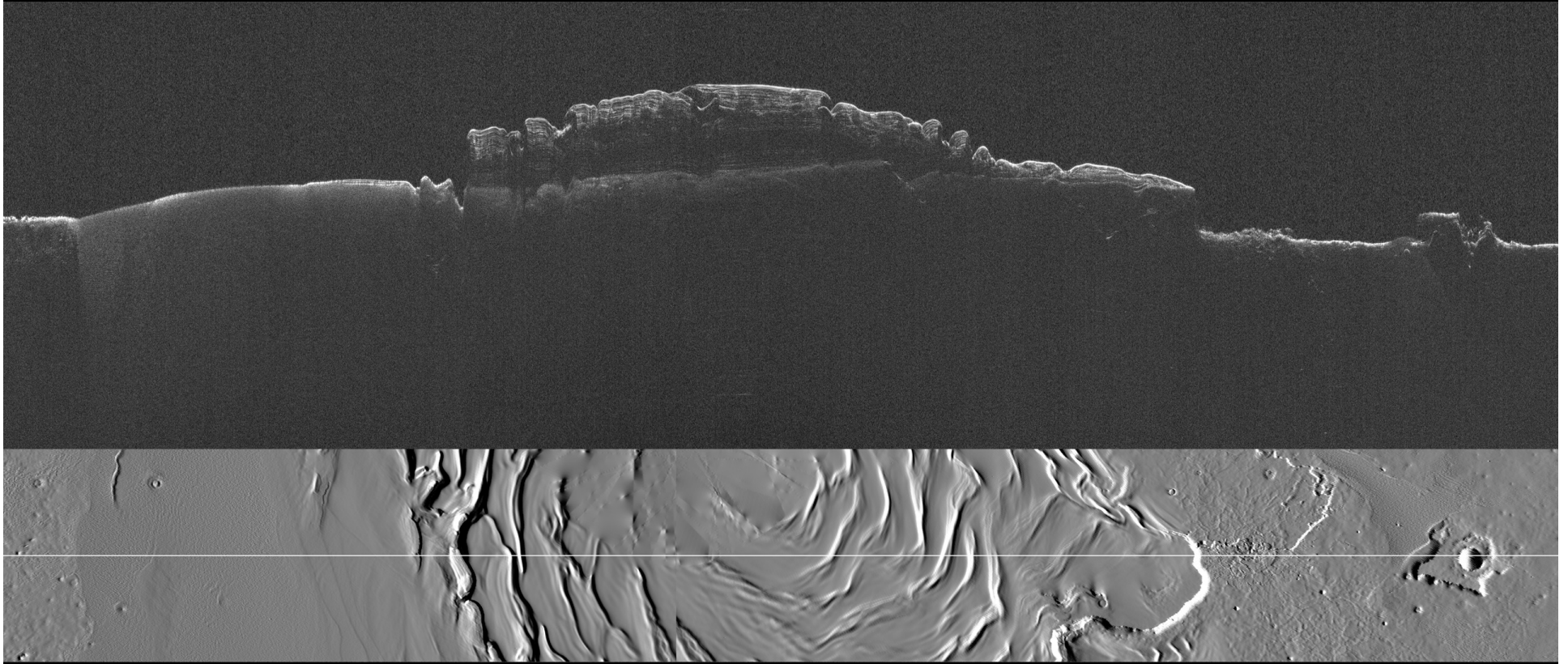


# Time Delay



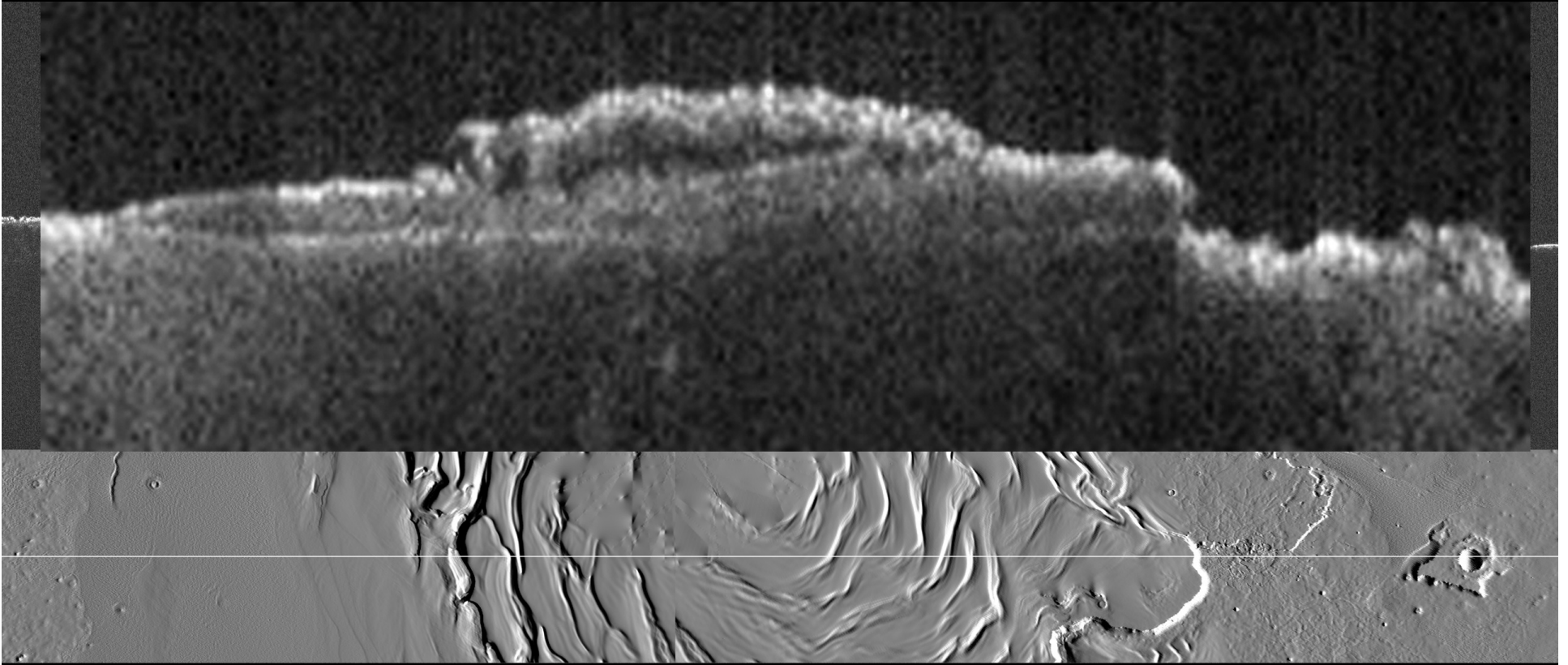
SHARAD 12531\_01 + 18451\_02

# Depth



SHARAD 12531\_01 + 18451\_02

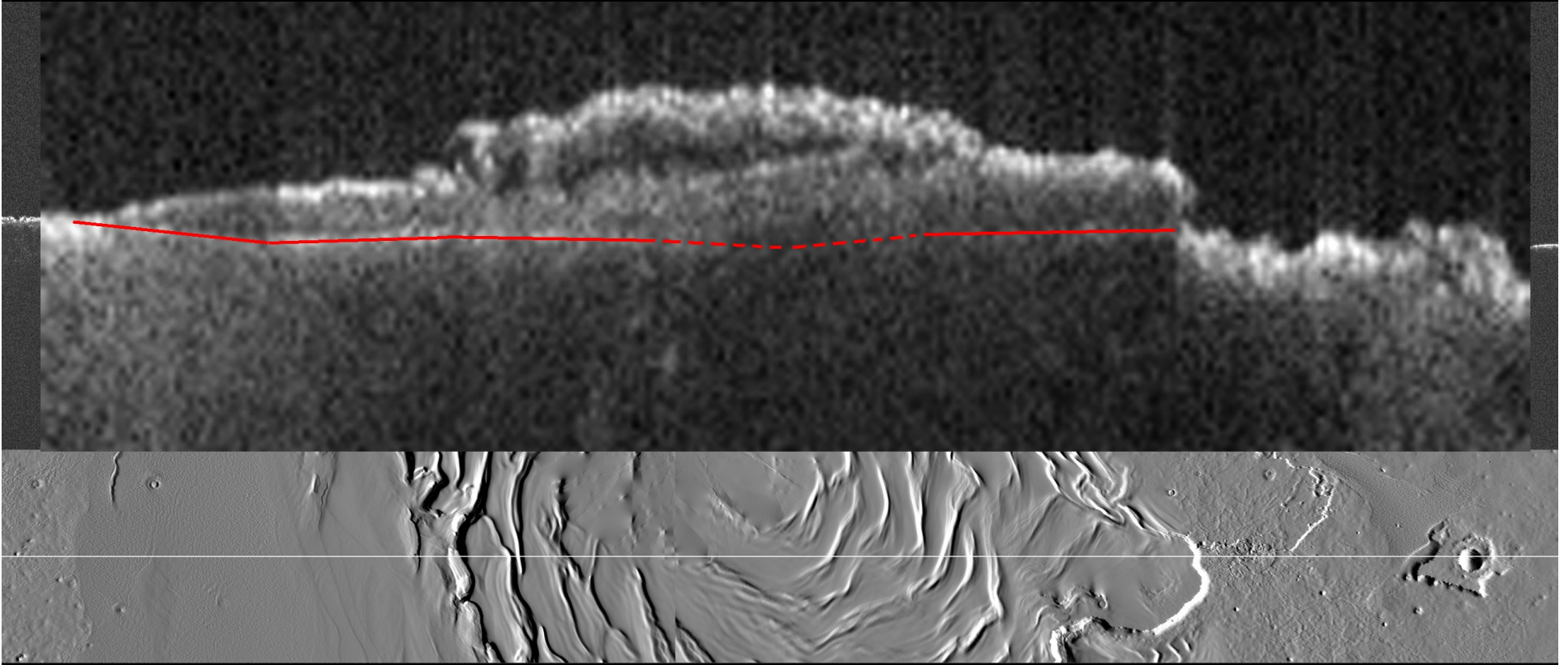
# Depth



MARSIS 9548



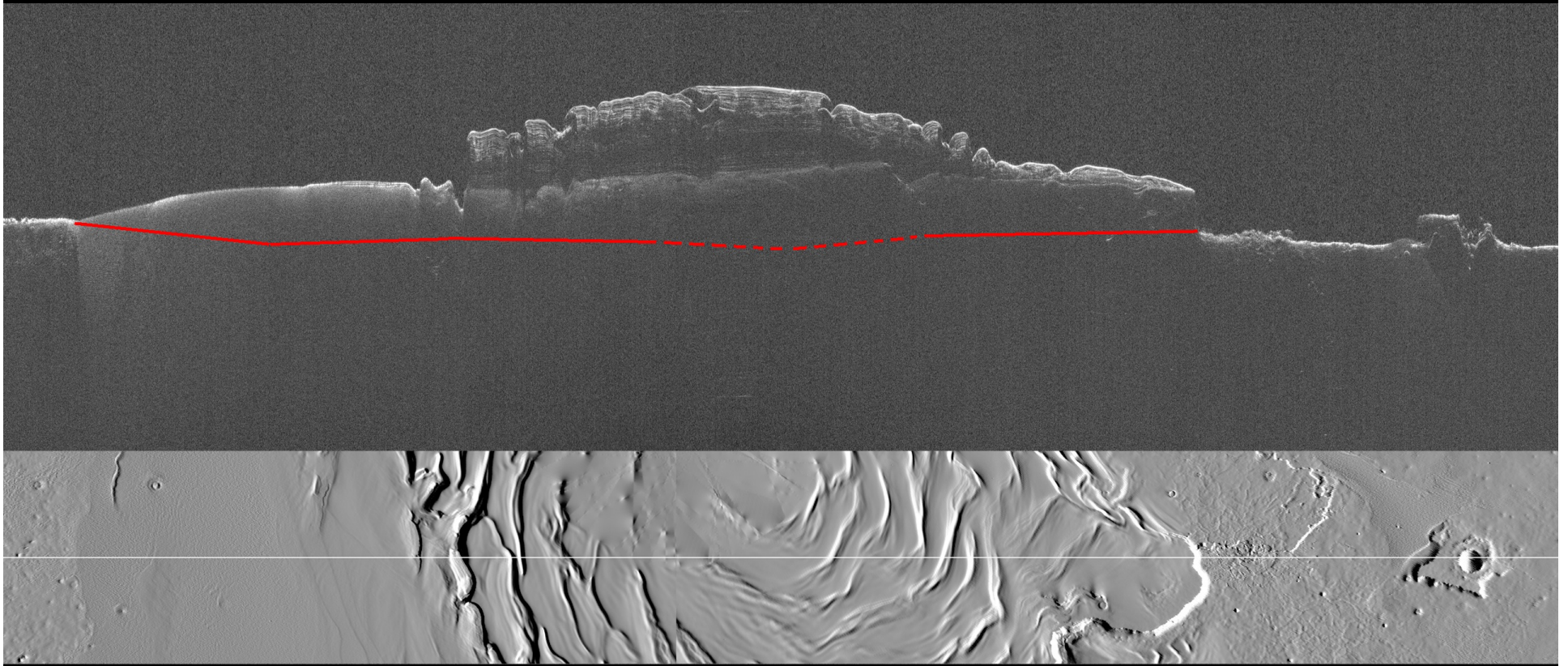
# Depth



MARSIS 9548

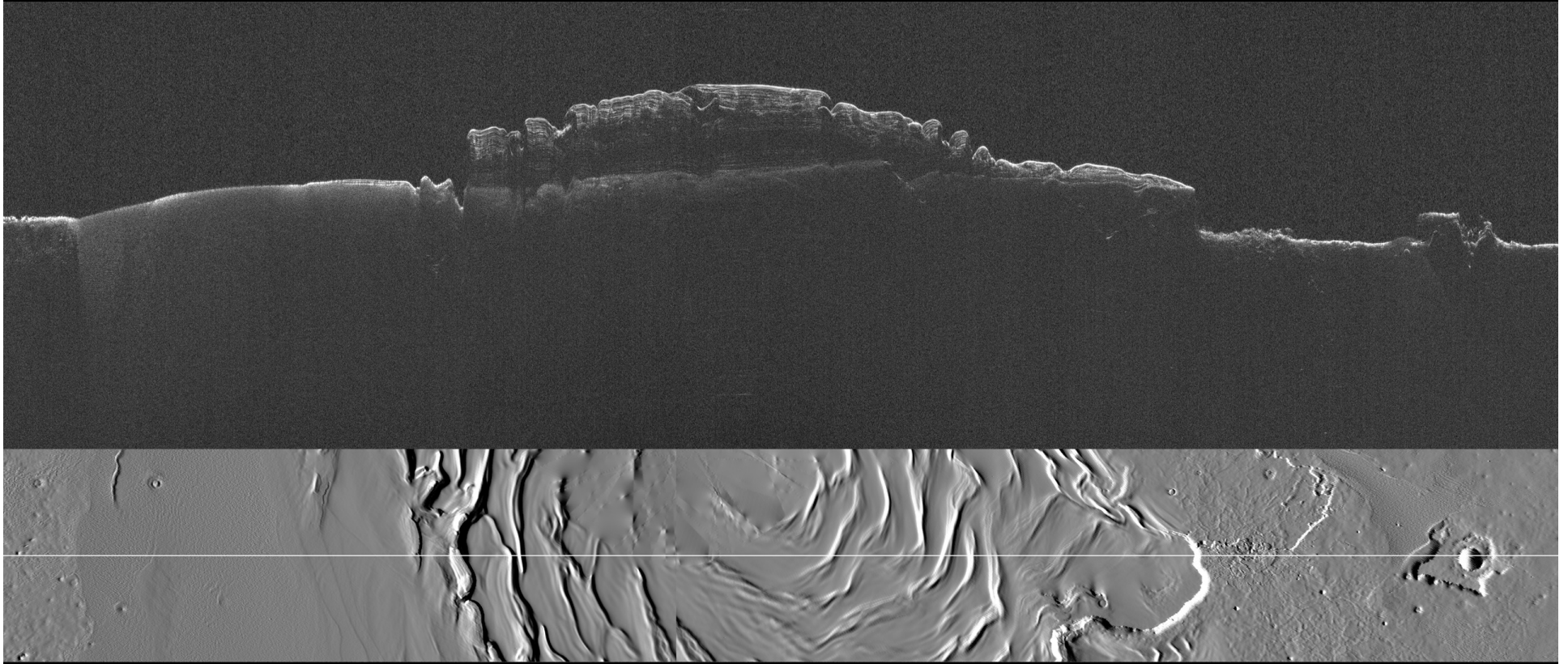


# Depth



SHARAD 12531\_01 + 18451\_02

# Depth

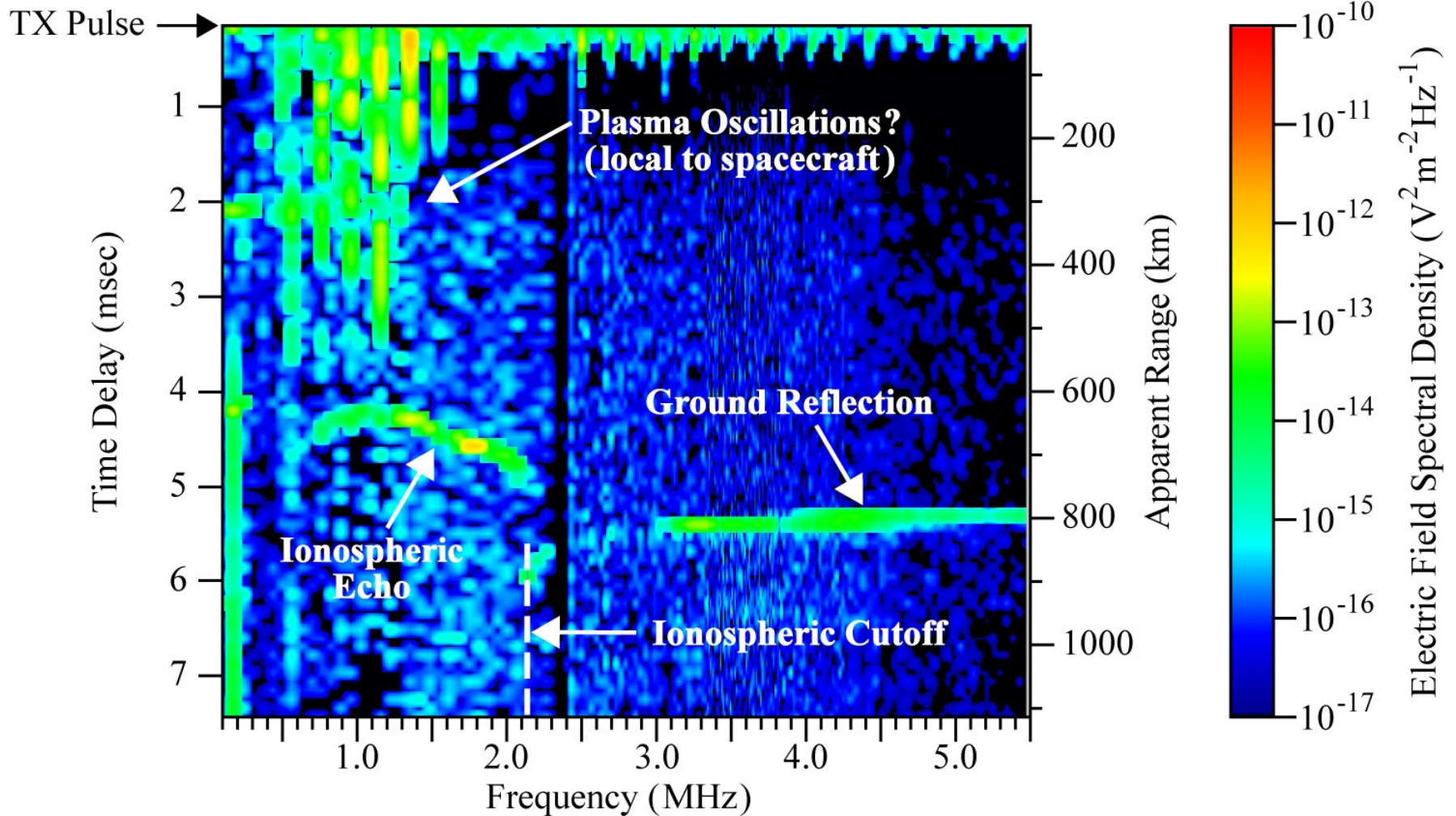


SHARAD 12531\_01 + 18451\_02



# Typical MARSIS Ionogram

A-D05-114-4

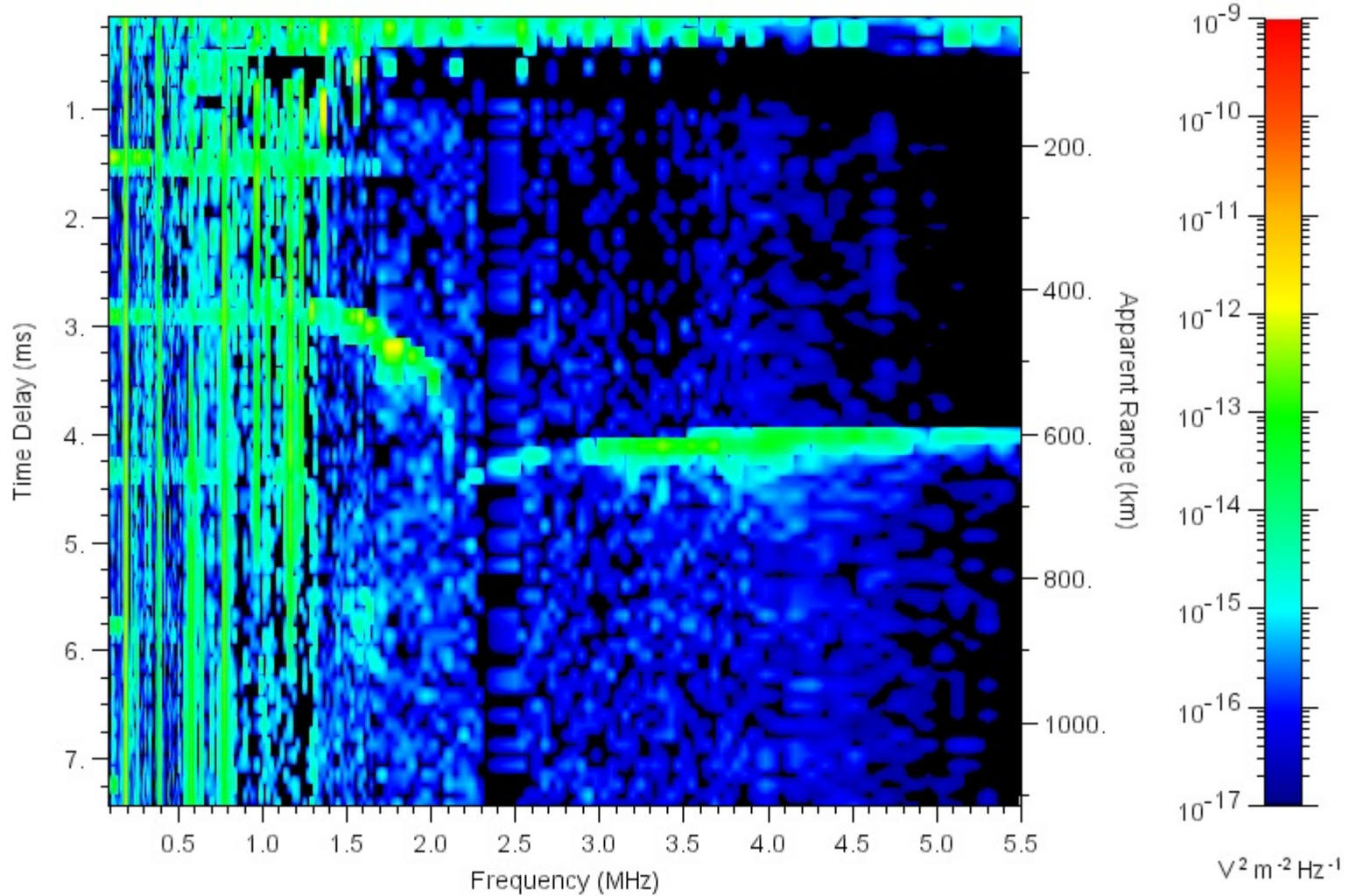


Day 177, June 26, 2005 Time 10:34:47

Orbit 1856, Altitude 792 km, SZA 85.2°, Lat -14.2, Long 84.17

# Single Echo – Example 1

Orbit: 2023 2005-08-12 (Day 224) 05:08:37.857 SZA: 84.84 Altitude: 584 Lat: 39.97 Long: 296.51



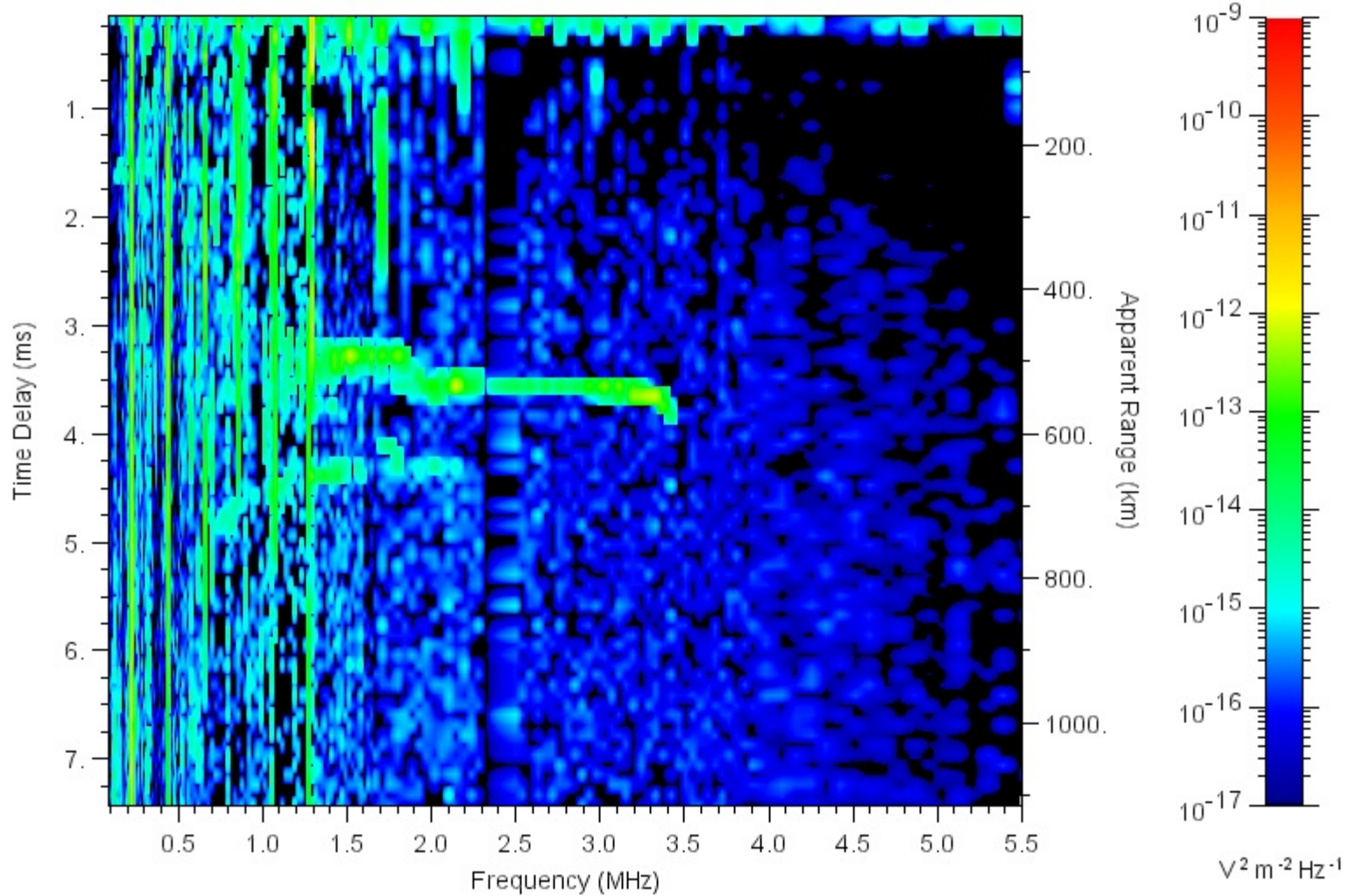
UOMA 20050922





# Double Echo – Example 1

Orbit: 2156 2005-09-18 (Day 261) 10:41:31.350 SZA: 51.25 Altitude: 625 Lat: 19.51 Long: 45.12



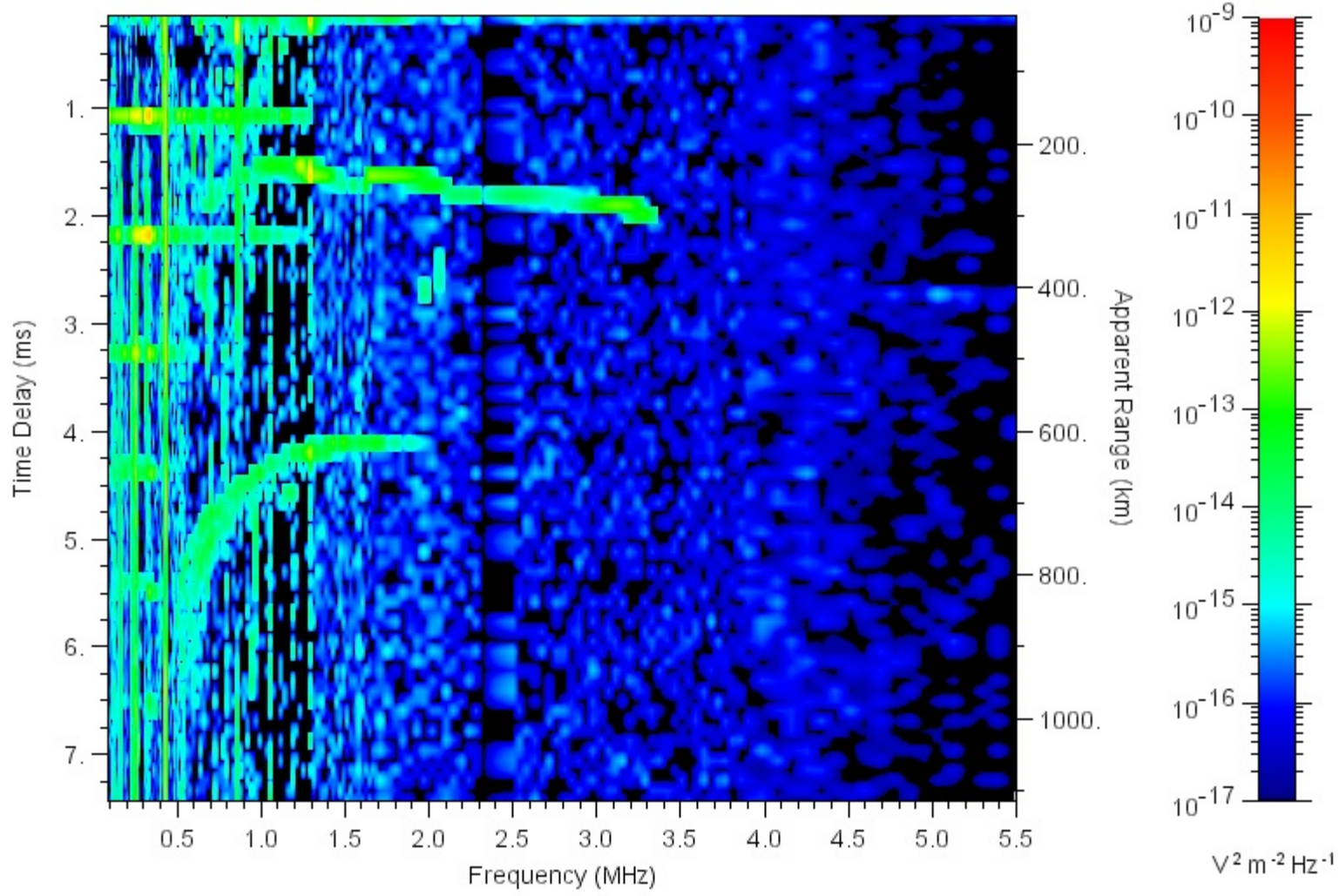
UOMA 20050922





# Double Echo, Example 2

Orbit: 2023 2005-08-12 (Day 224) 04:53:17.587 SZA: 50.64 Altitude: 389 Lat: -18.63 Long: 296.75



UICMA 20050923



# Explanation of Double Echoes

A-D05-112-1

