Enigmatic Wrinkle Ridges in martian northern plains

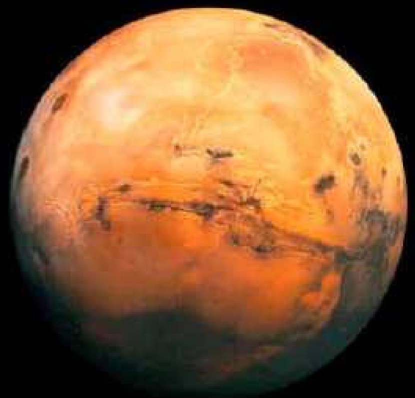
Paul Withers,
Lunar and Planetary Laboratory,
University of Arizona

GSSP Presentation
09 August 2000
Mentor: Greg Neumann

Mars Global Surveyor Project

Comparison of Earth and Mars

12,756 km
Diameter



6,794 km
Diameter

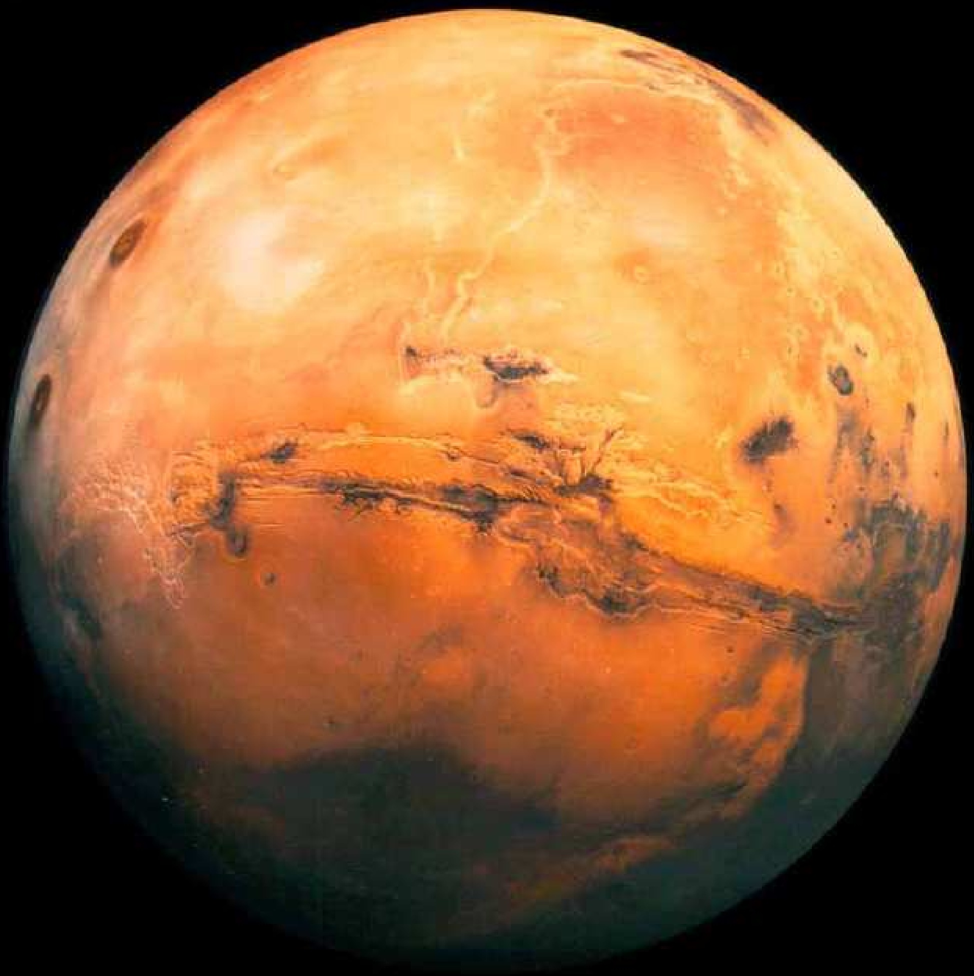
WL JLC
July 1995

JPL

Mars Global Surveyor Project

Simple Facts About Mars

NASA



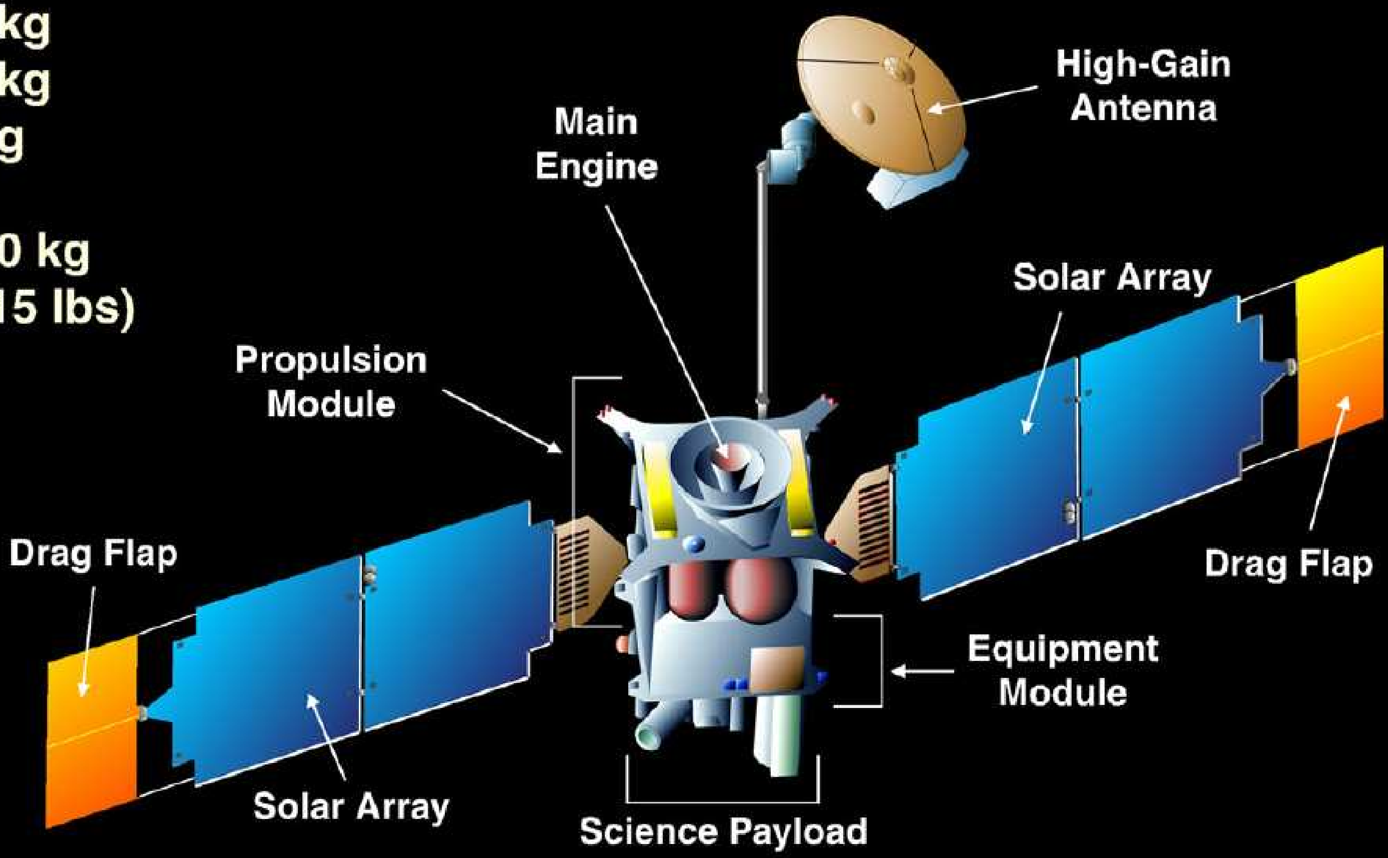
Diameter:	6,794 km (53% of Earth)
Mars Day:	24 hrs, 37 min
Mars Year:	687 Earth Days
Mass:	11% of Earth
Gravity:	38% of Earth
Atmosphere:	95% Carbon Dioxide, 3% Nitrogen
Atmospheric Pressure:	1% of Earth's Sea Level
Temperature at Surface:	Average Between -140 to 20 Celsius

WL JLC
May 1995

Mars Global Surveyor Project

MGS Spacecraft In Mapping Configuration

Structure Mass:	595 kg
Propellant Mass:	380 kg
Payload Mass:	75 kg
Total Mass:	1,050 kg (2,315 lbs)



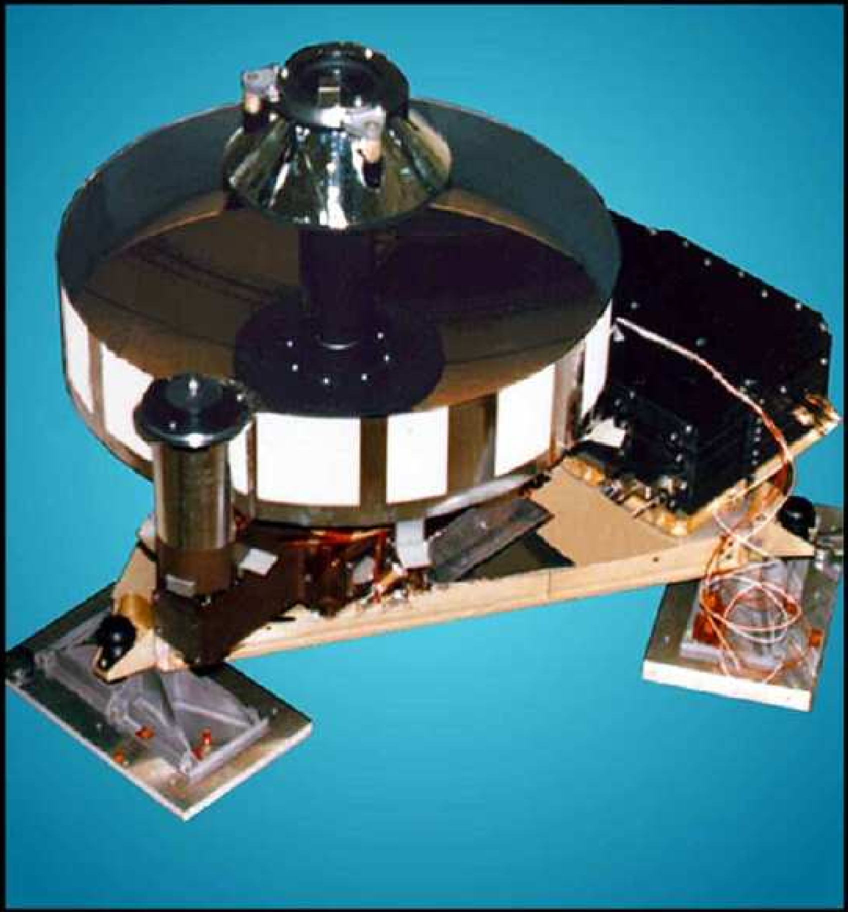
Science Payload:

Electron Reflectometer
Magnetometer
Mars Orbiter Camera
Mars Orbiter Laser Altimeter
Mars Relay Radio System
Radio Science
Thermal Emission Spectrometer

WL JLC DAS
Dec 1995

Mars Global Surveyor Project

Mars Orbiter Laser Altimeter



Measurements:
Altitude of Spacecraft above the Surface

Resolution:
Vertical: 2 m (local), 30 m (global)
Horizontal: 160 m

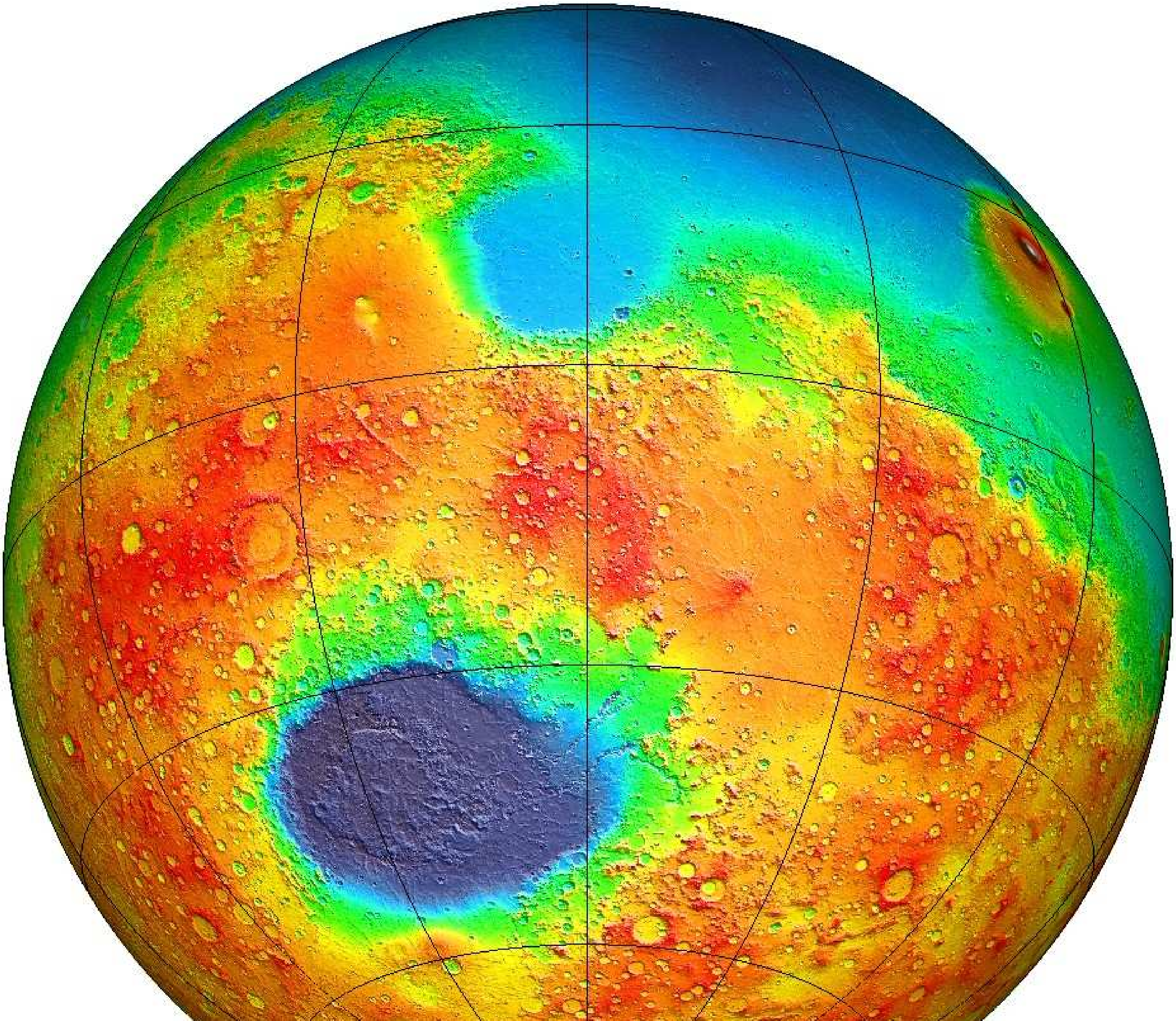
Laser Transmitter:
Diode Pumped, Q-Switched Nd:YAG Laser
40-45 mJ/pulse @ 10 pulses/sec continuous

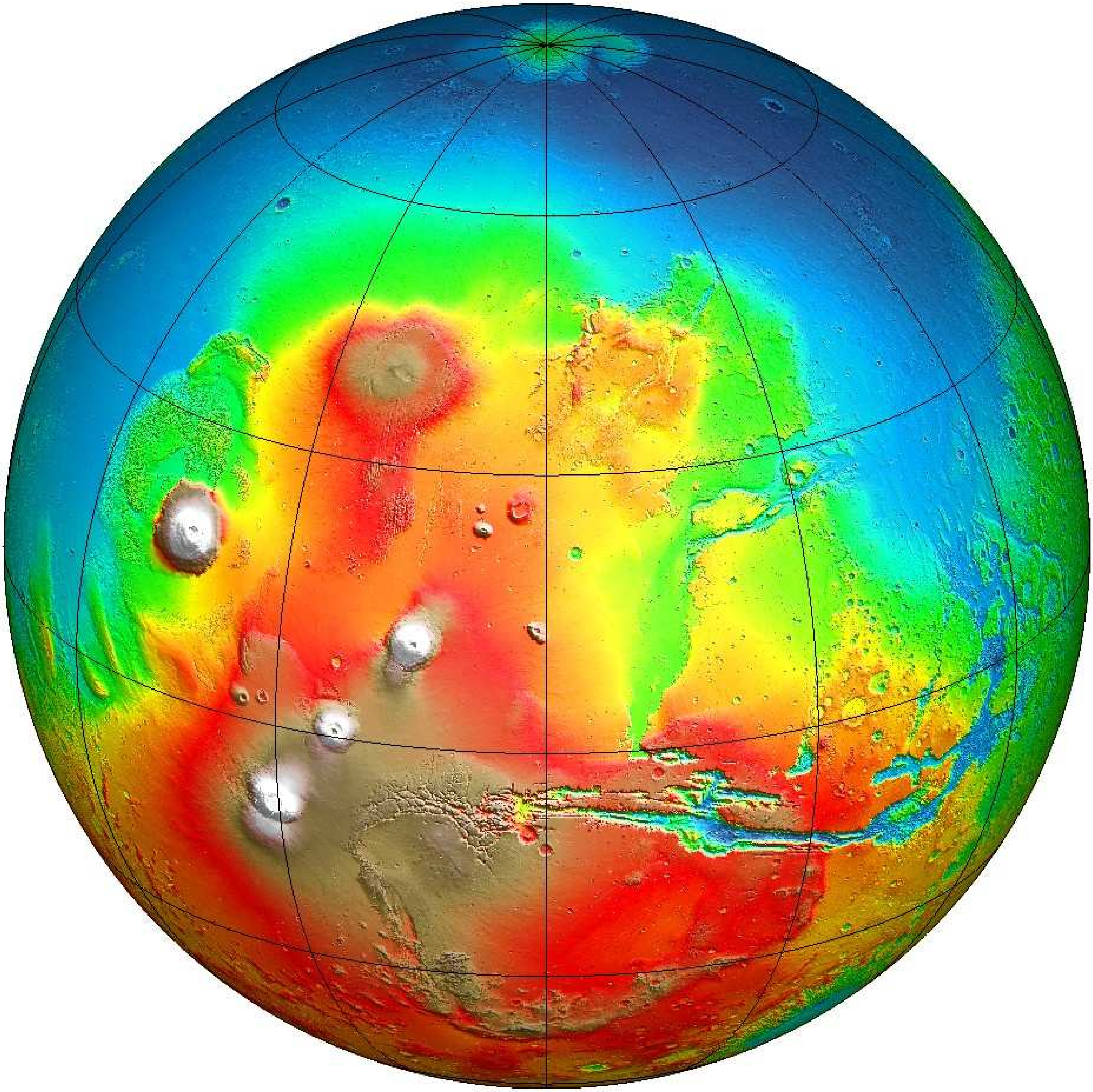
Antenna Receiver:
50 cm Parabolic Antenna (0.85 mrad FOV)
with Si APD Detector
4 Electronic Filters (20, 60, 180 and 540 ns)

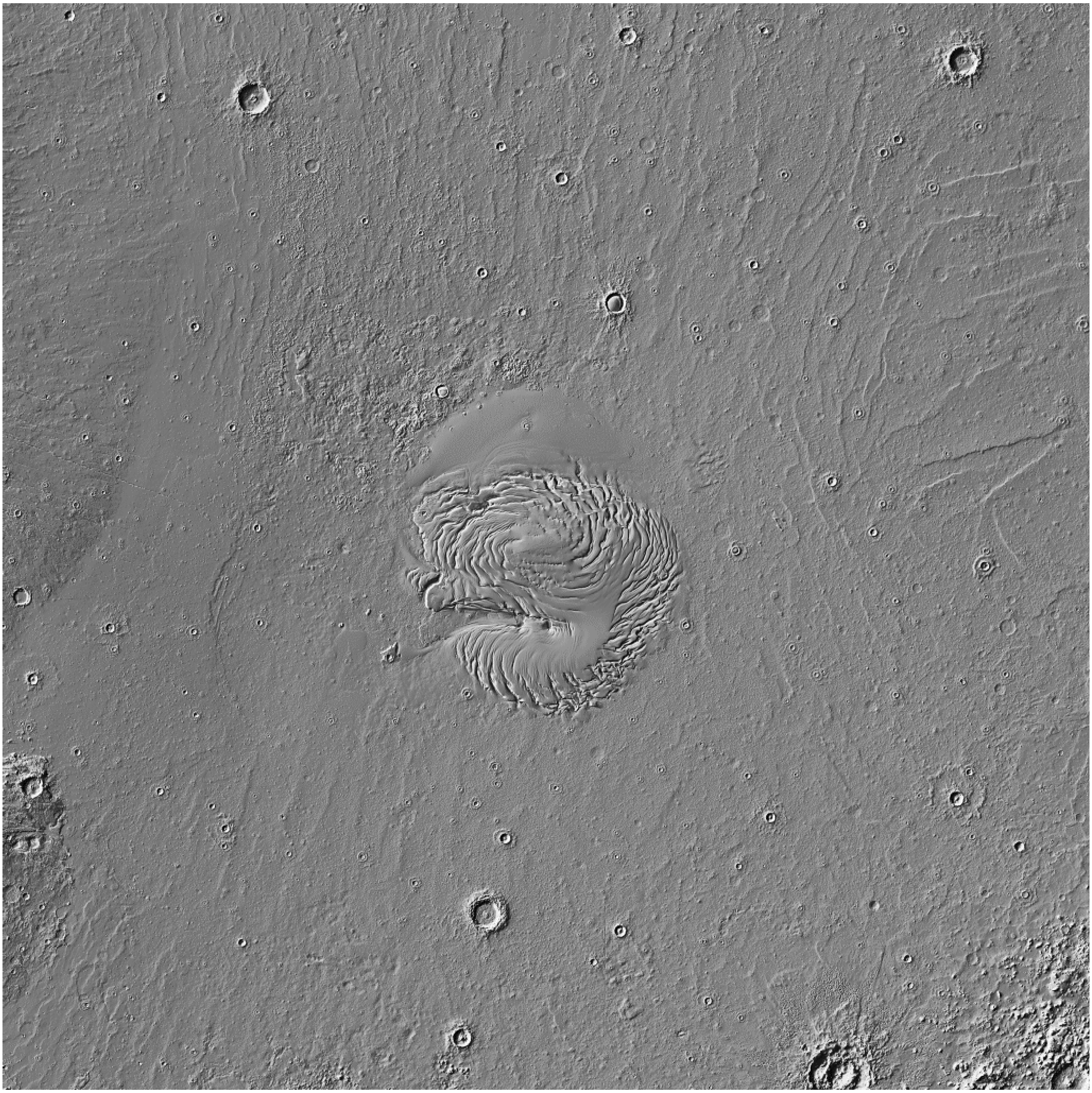
Electronics:
80C86 Microprocessor, 54HC Family Logic
Data Rate: 618 bits/sec

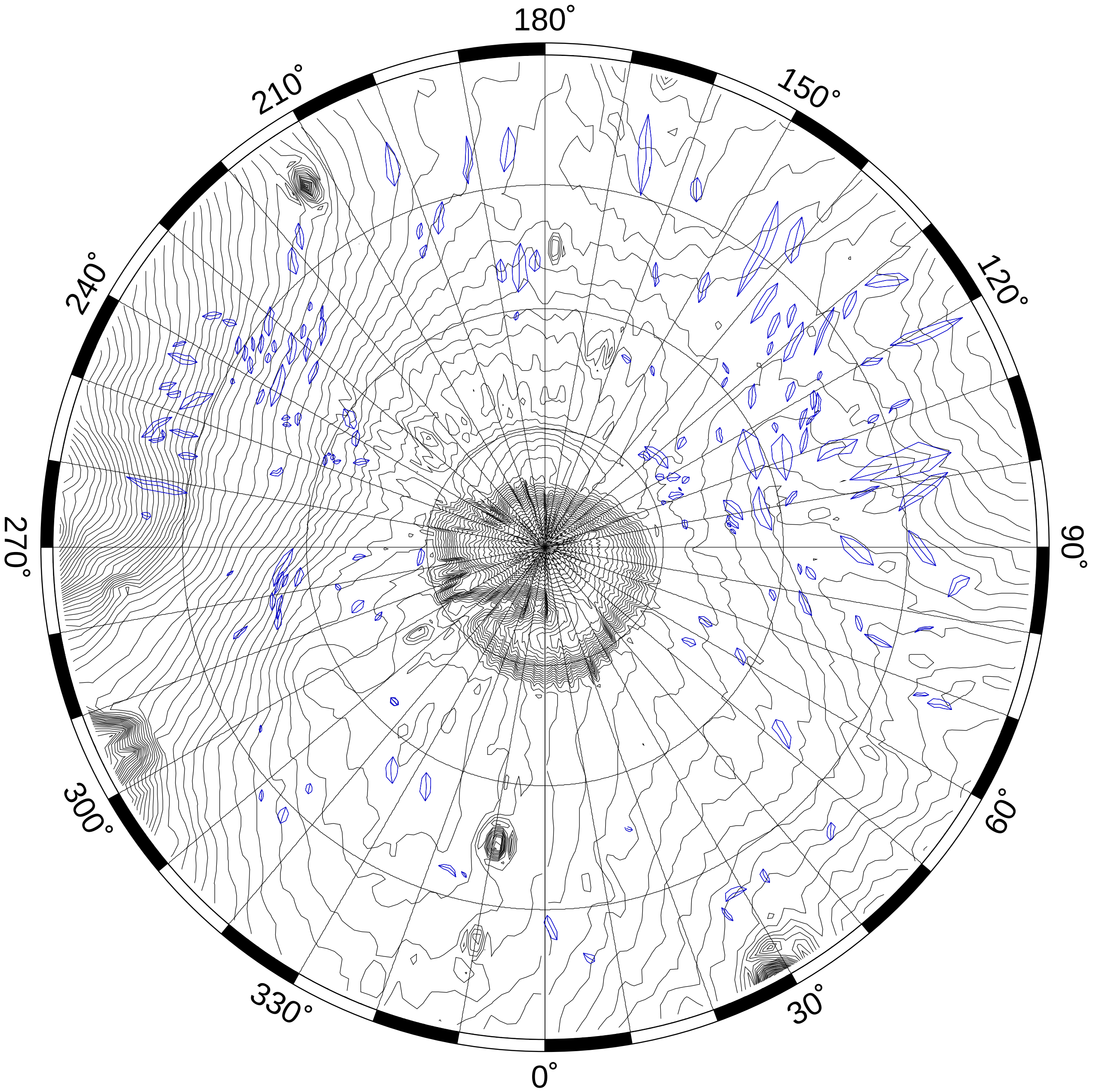
Physical Characteristics:
25.9 kg, 30.9 W (avg.), 34.9 W (peak)

WL JLC

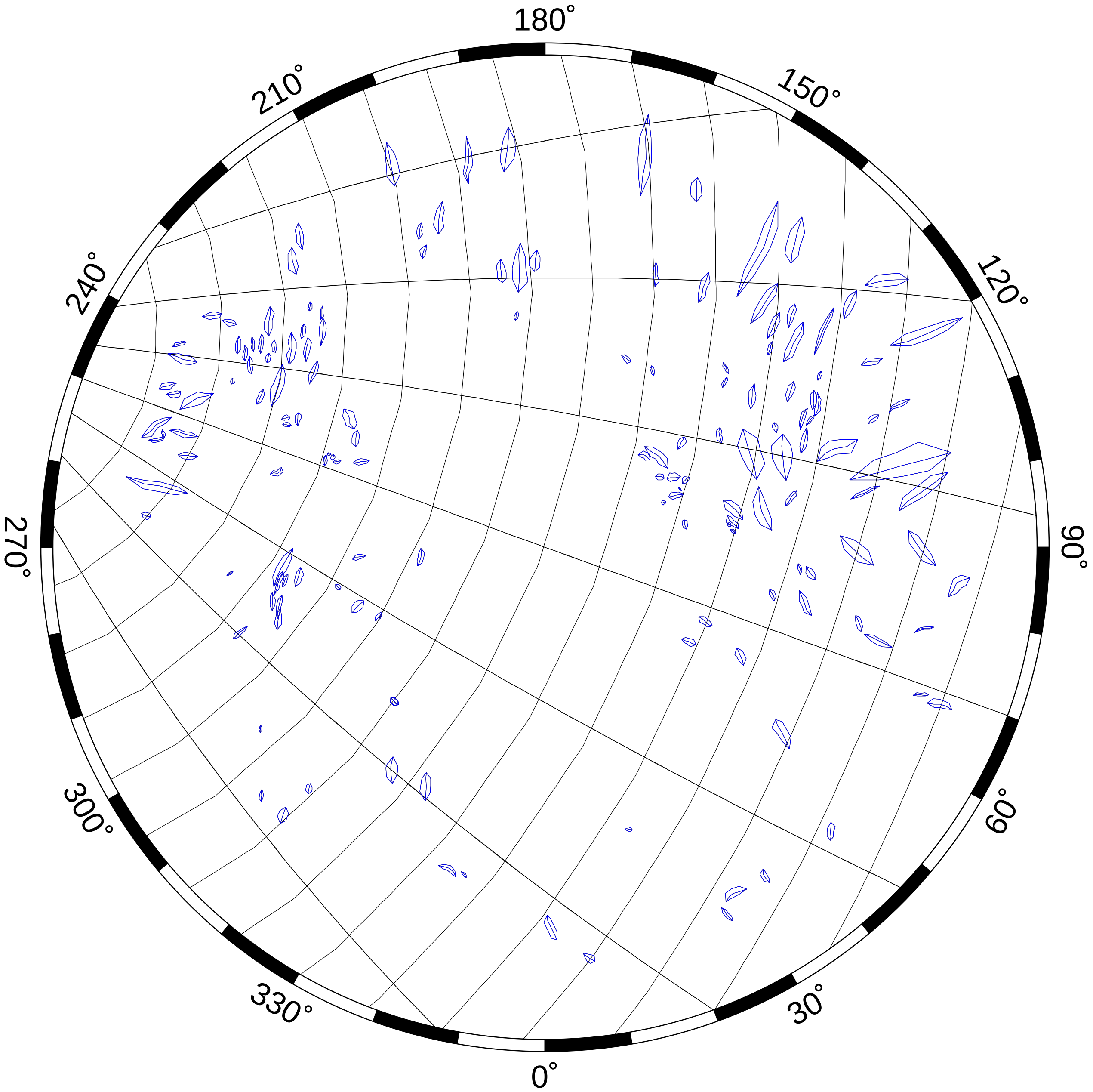








180°
150°
120°
90°
60°
30°
0°
330°
300°
270°
240°
210°



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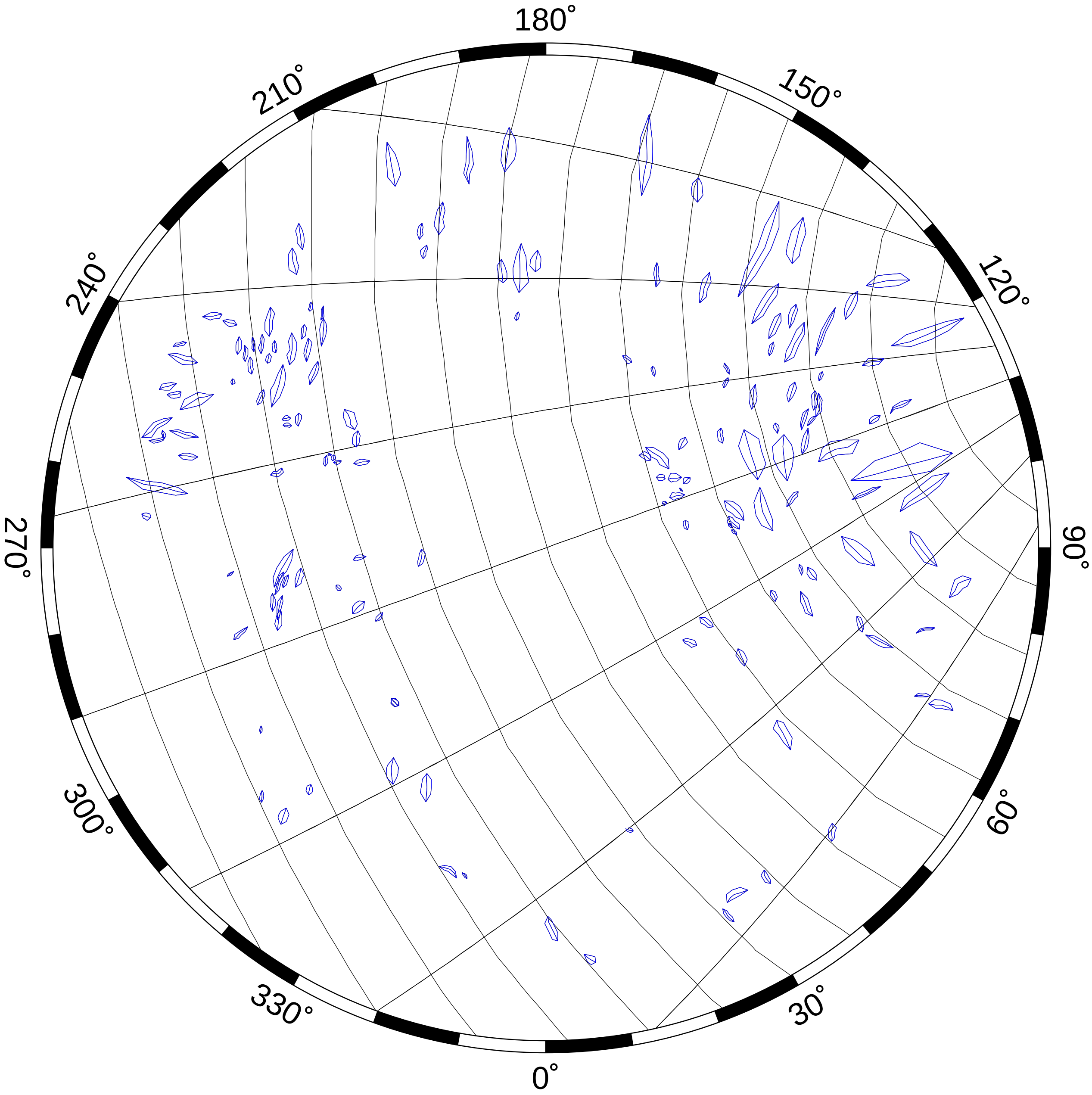
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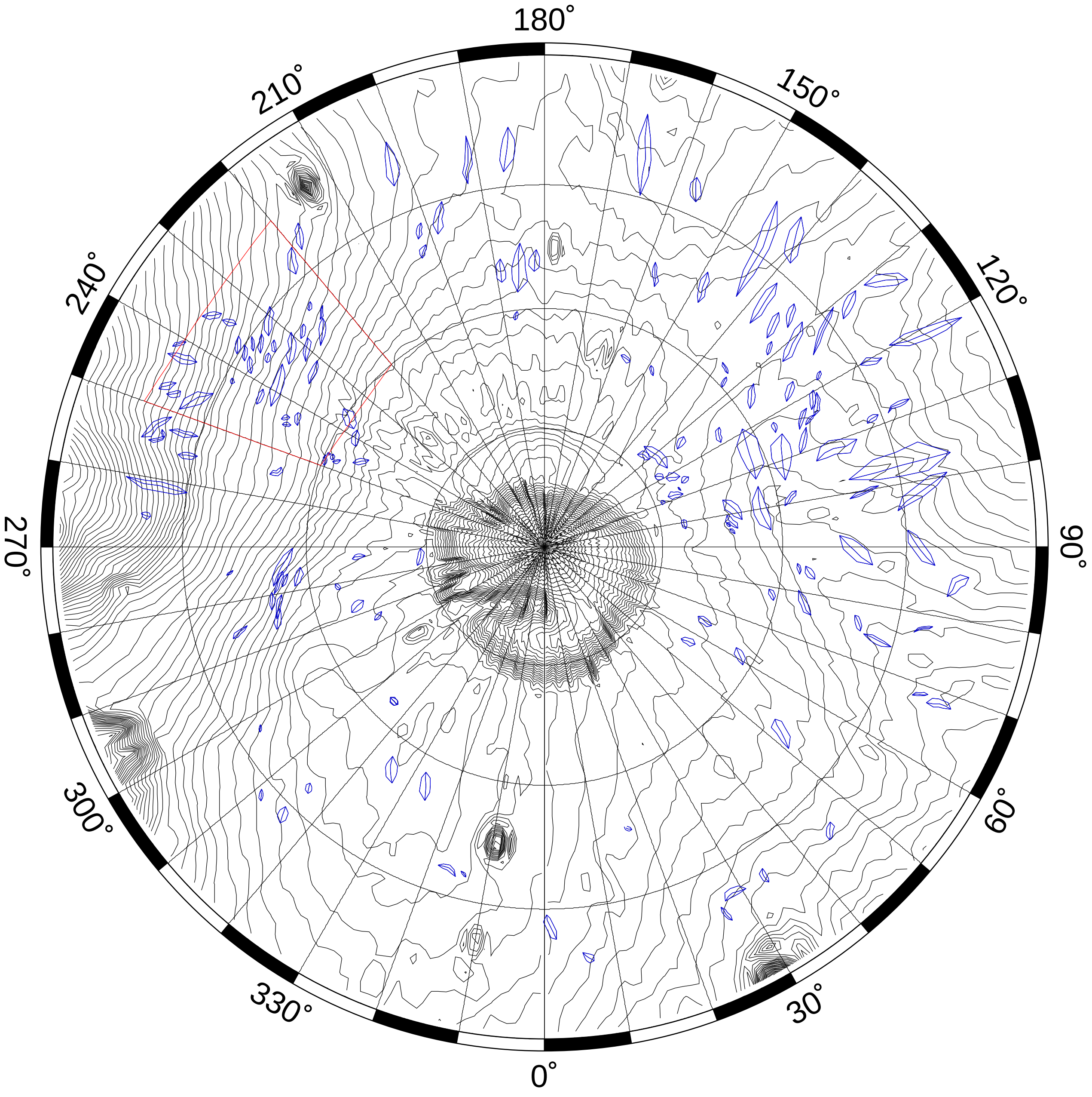
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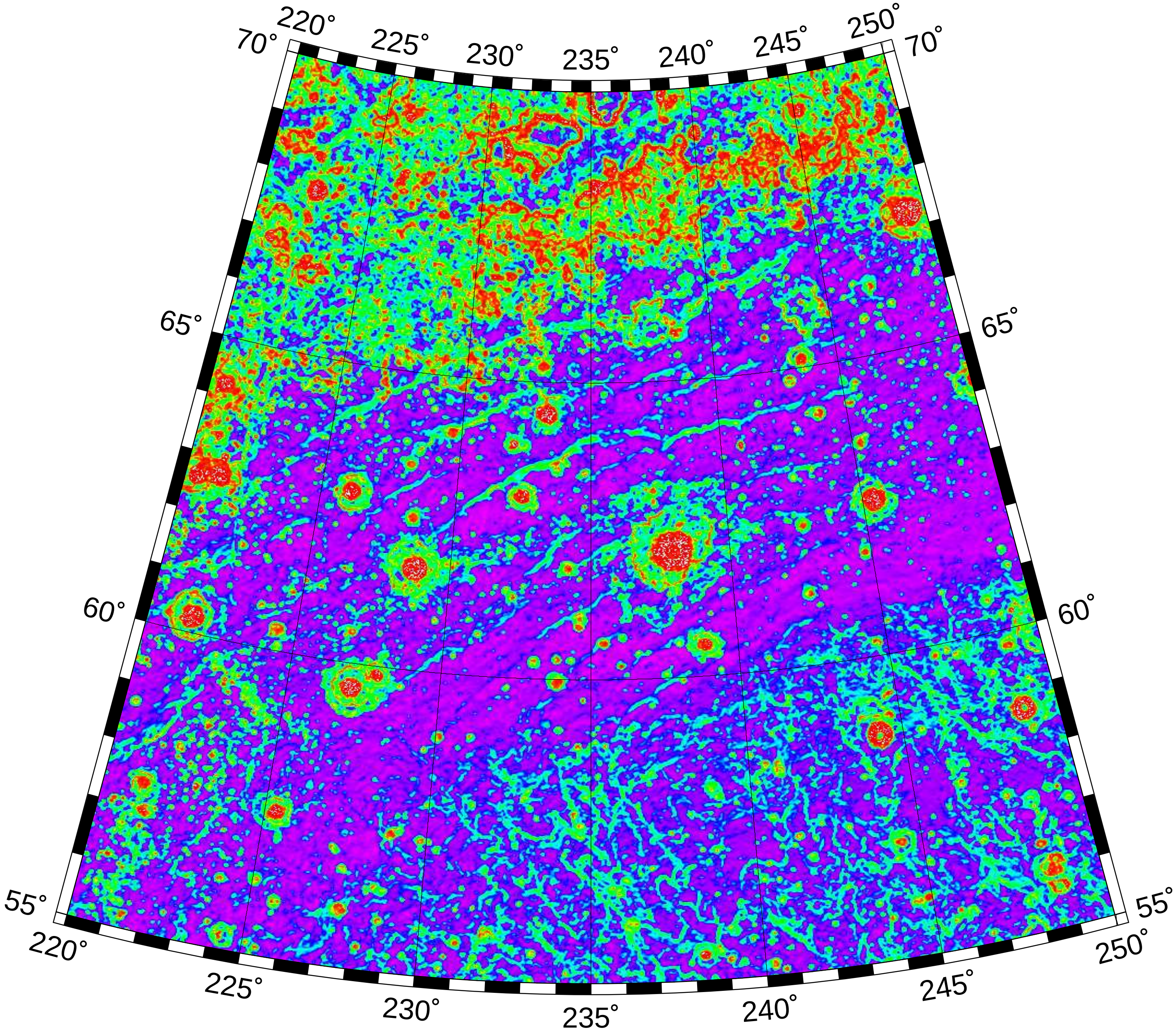

220°
225°
230°
235°
240°
245°
250°
70°
70°
65°
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245°
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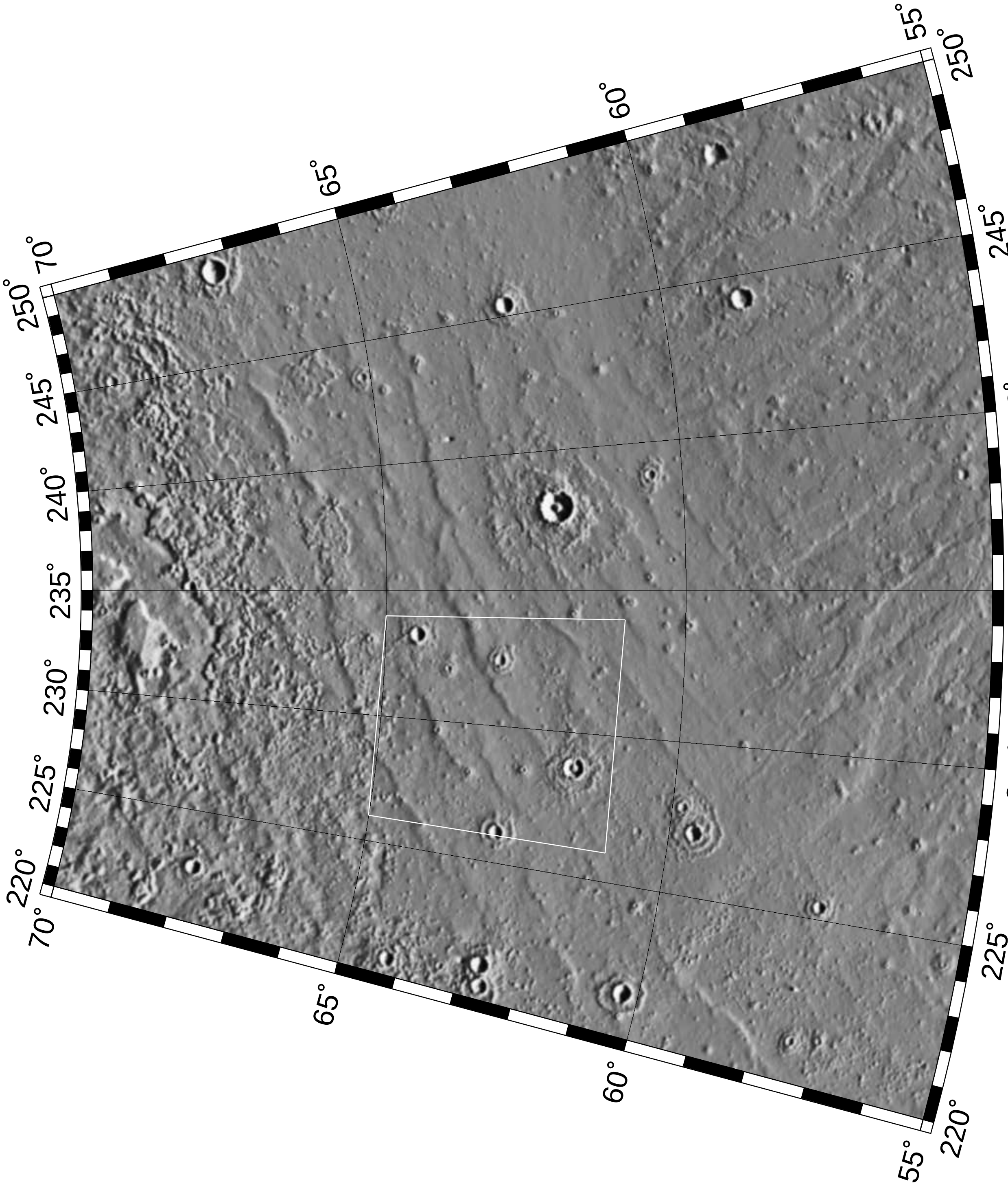
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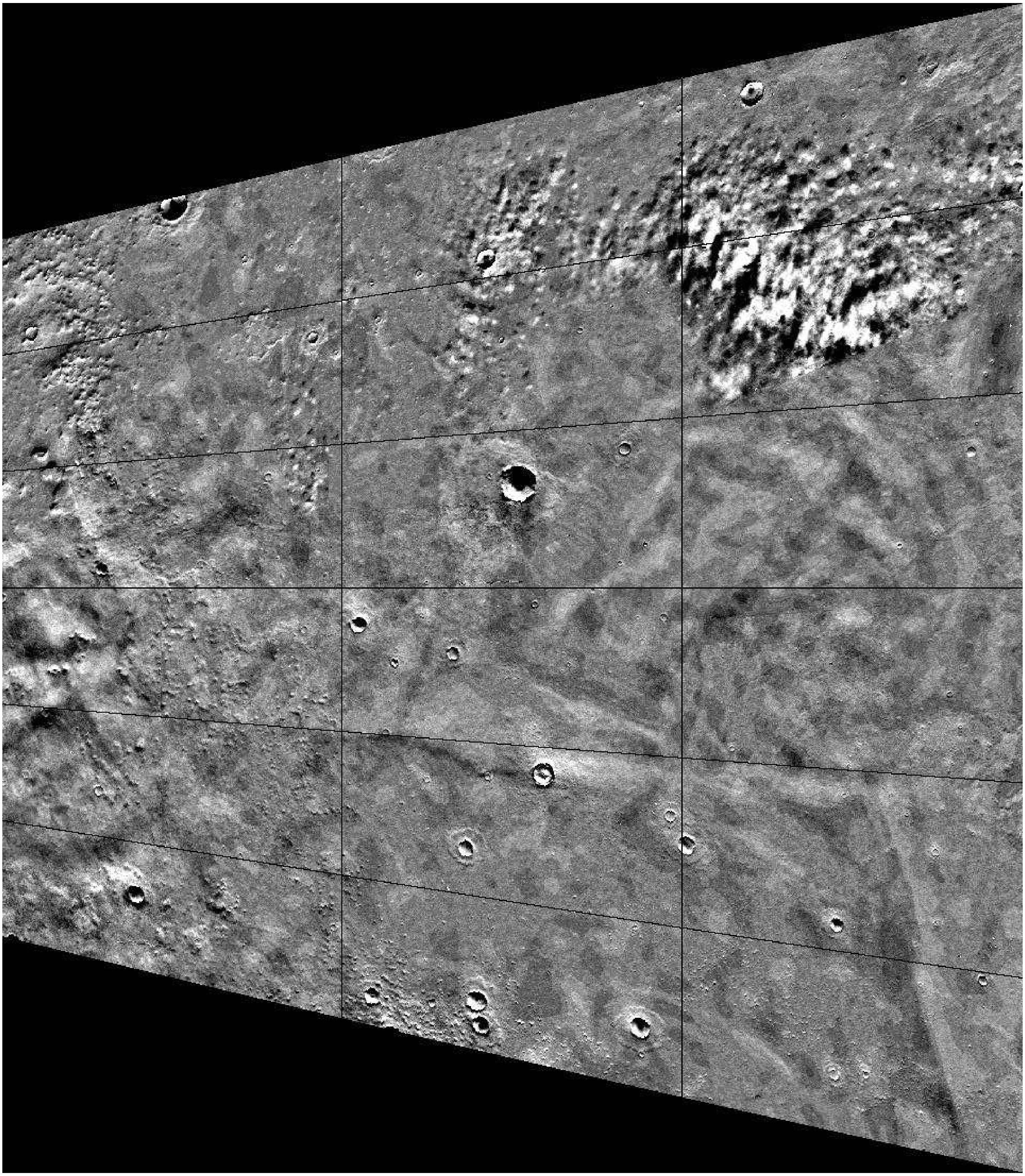
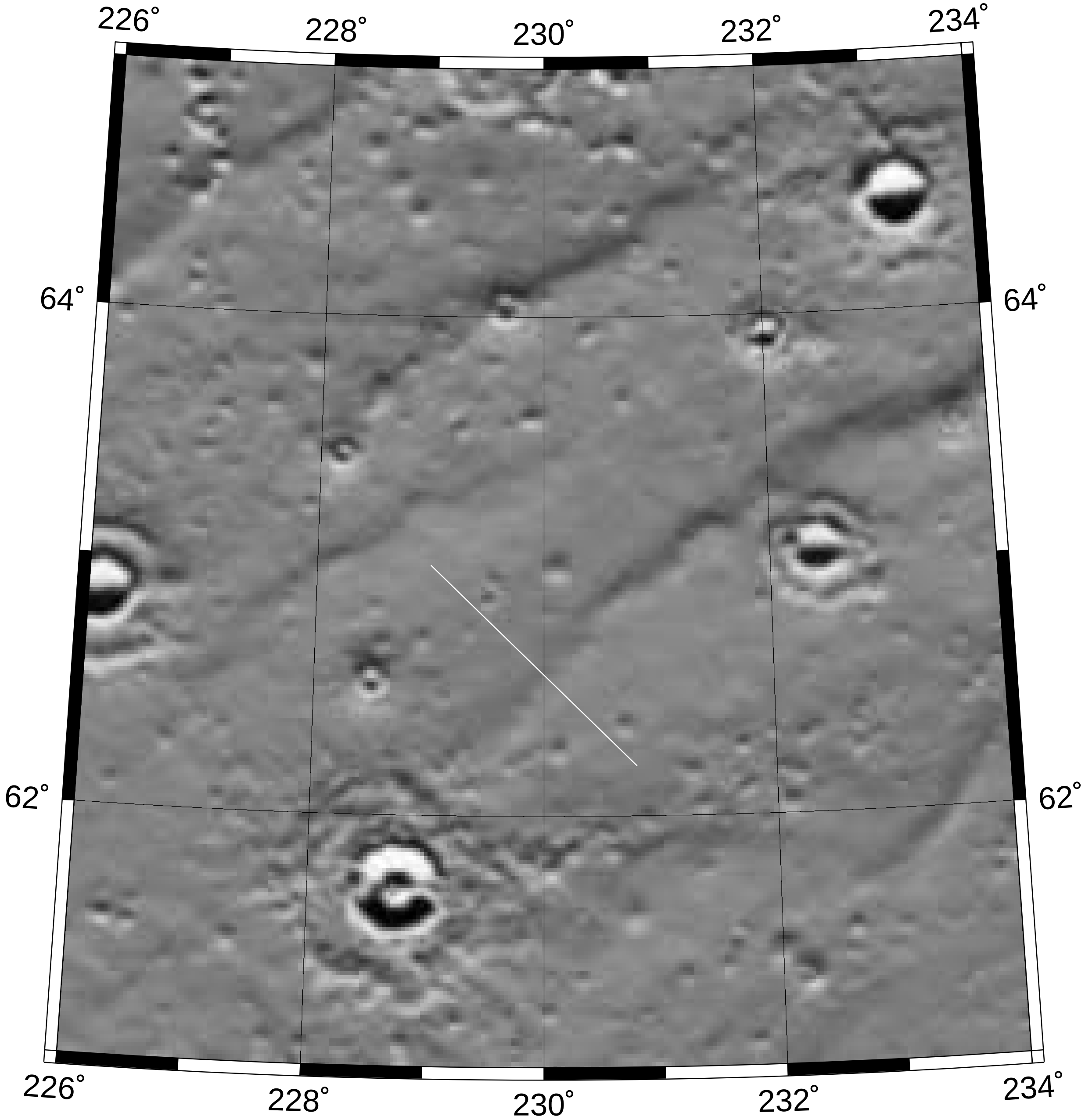
235°
230°
225°
220°




226°
228°
230°
232°
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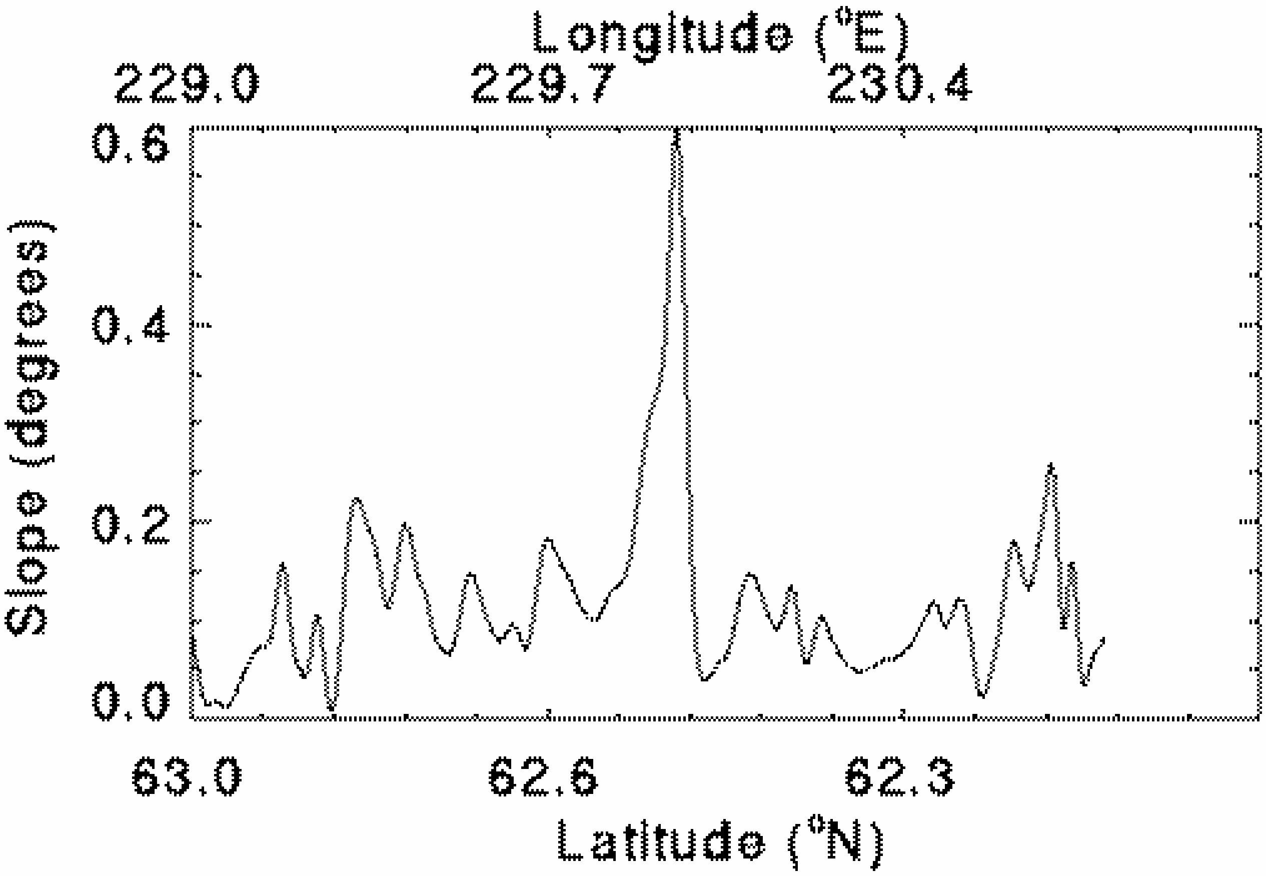
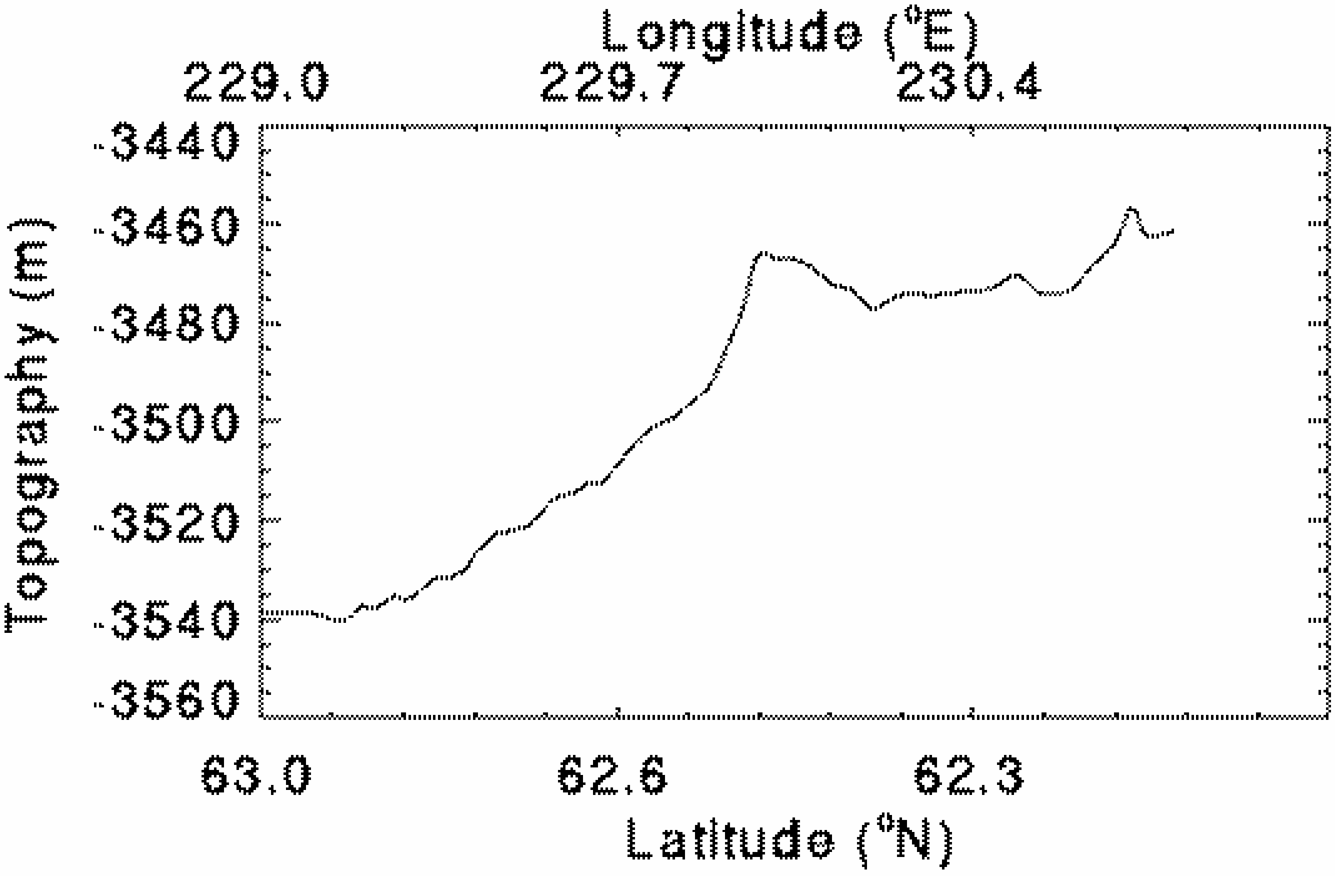
64°
64°
62°
62°
226°
228°
230°
232°
234°


Longitude (°E)
229.0
229.7
230.4
Slope (degrees)
0.6
0.4
0.2
0.0
63.0
62.6
62.3
Latitude (°N)


Longitude (°E)
229.0
229.7
230.4
Topography (m)
-3440
-3460
-3480
-3500
-3520
-3540
-3560
63.0
62.6
62.3
Latitude (°N)

Future Work

Examine high resolution images
Analyse profiles
Shorelines hypothesis?
Quantify relation to stress centres

Dissemination of Work

Continue collaboration with mentor and MOLA team

Present preliminary work at MOLA team meeting, Boulder, September

Present work at Fall AGU conference, San Francisco, December

Eventually publish in peer-reviewed literature

Chapter in thesis