Landing Site Compositional Assessment Using High Resolution TES Data

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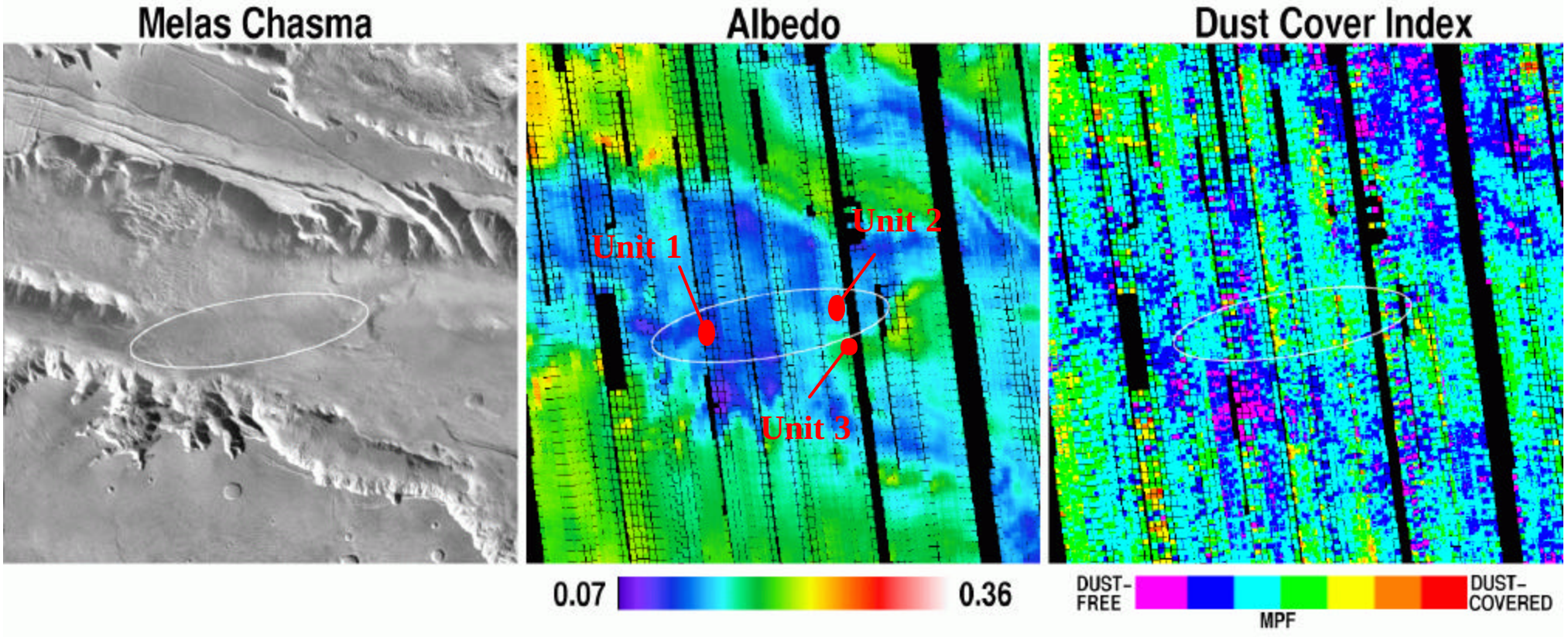
Endmember Suite

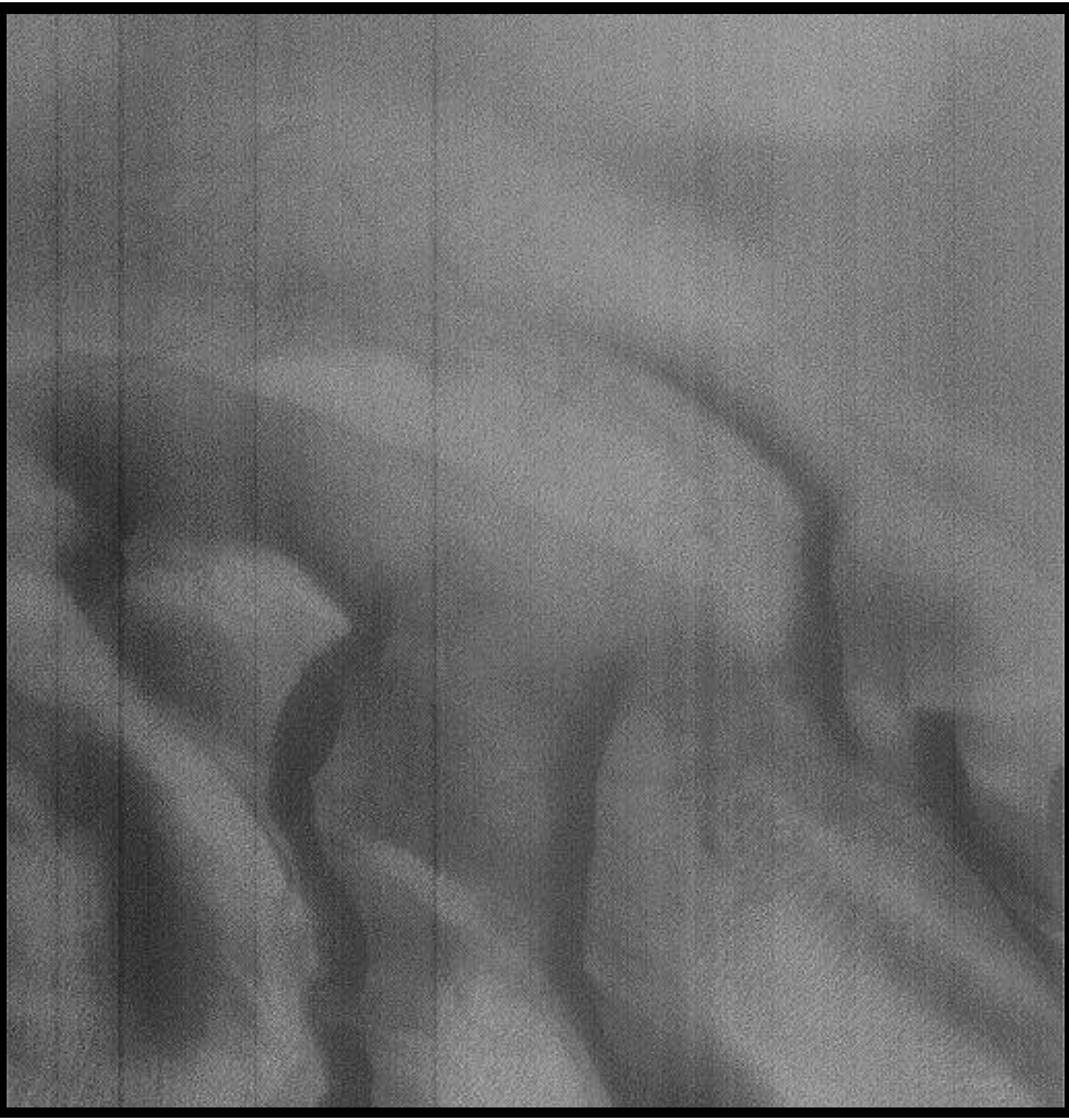
Minerals

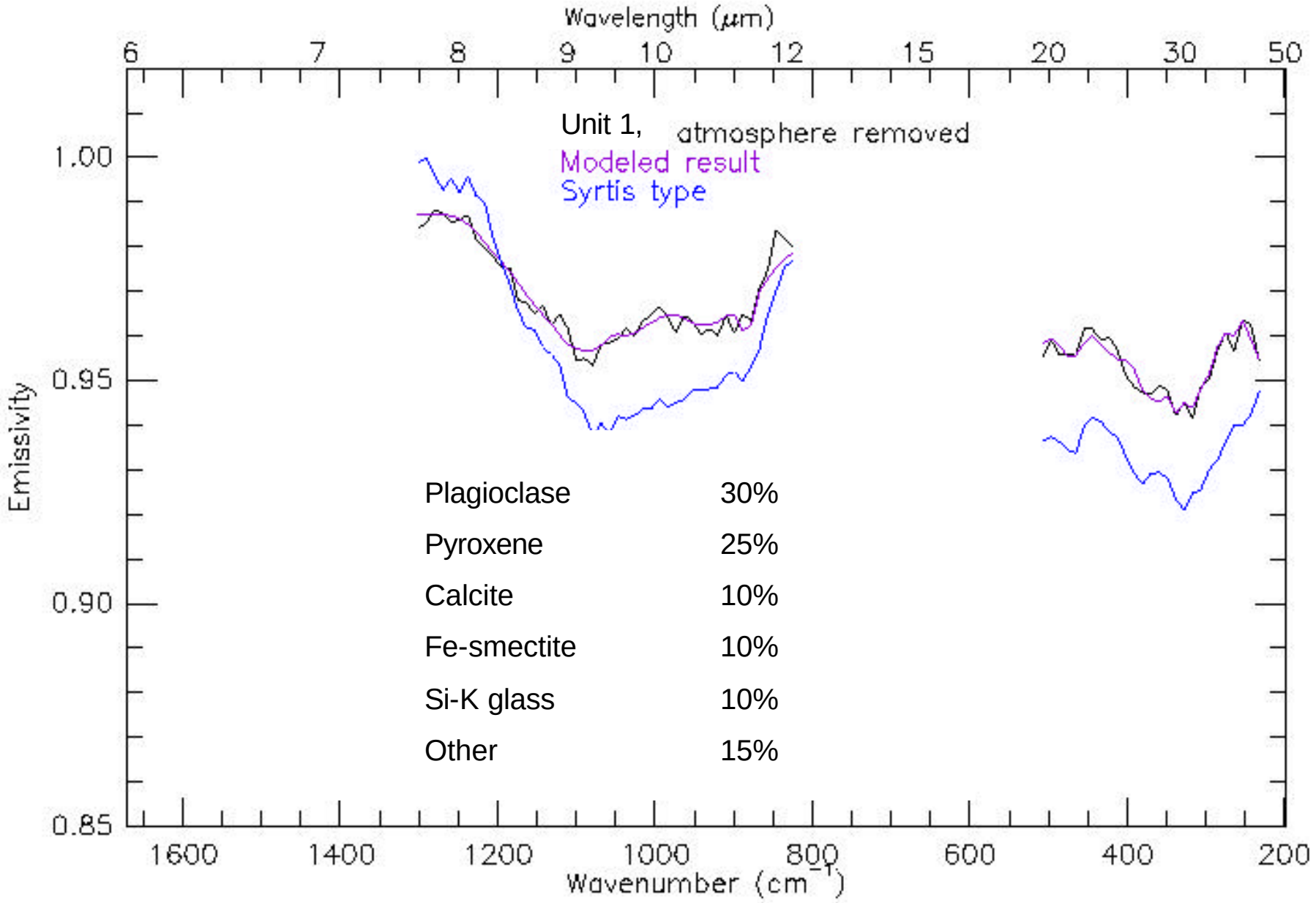
- Quartz
- Microcline
- Albite
- Oligoclase
- Andesine
- Labradorite
- Bytownite
- Anorthite
- Actinolite
- Biotite
- Muscovite
- Chlorite
- Enstatite
- Bronzite
- Diopside
- Augite
- Hedenbergite
- Serpentine
- Forsterite
- Fayalite
- Hematite
- Anydrite
- Gypsum
- Calcite
- Dolomite
- Nontronite
- Fe-Smectite
- Illite
- Si-K glass
- Basaltic glass

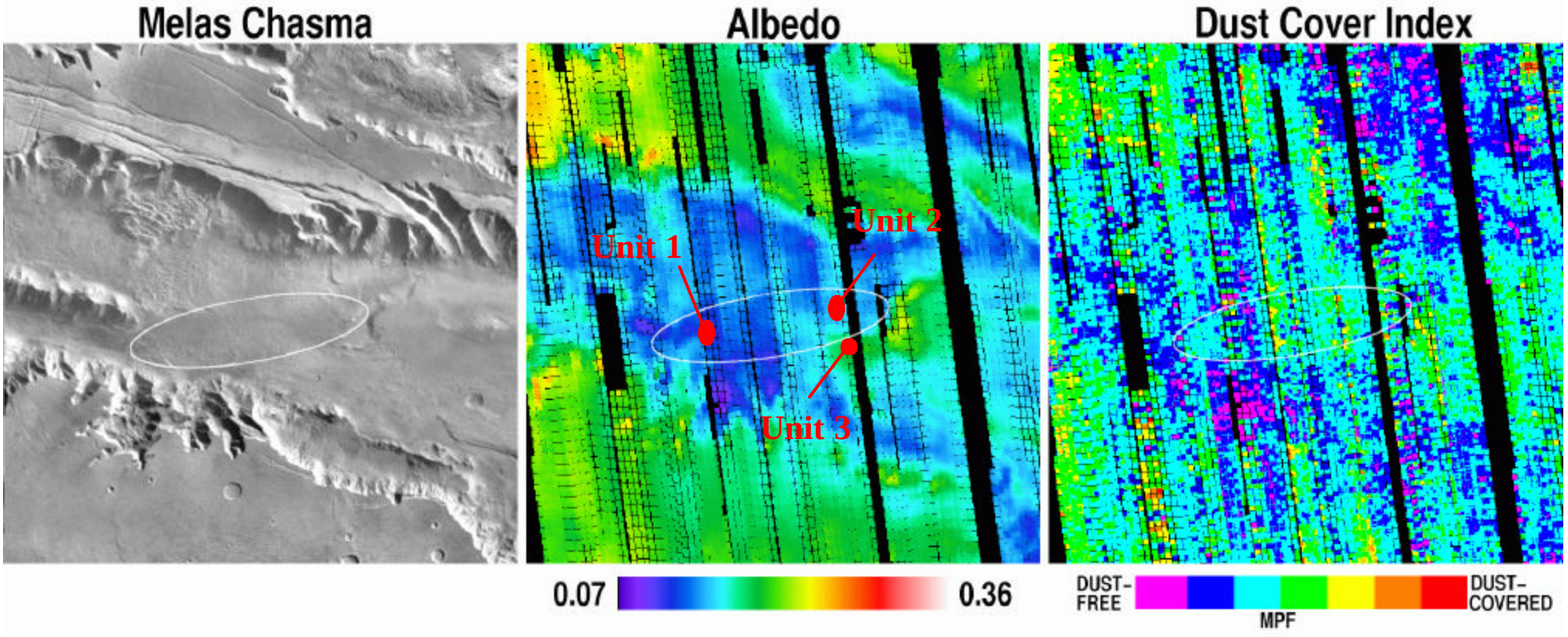
Atmosphere

- Atmospheric dust (low CO2)
- Atmospheric dust (high CO2)
- Water ice cloud (high latitude)
- Water ice cloud (low latitude)
- CO2 gas
- H2O gas


Melas Chasma
Albedo
Dust Cover Index
Unit 1
Unit 2
Unit 3
0.07
0.36
DUST-FREE
DUST-COVERED
MPF




Wavelength (μm)
6
7
8
9
10
12
15
20
30
50
Unit 1, atmosphere removed
Modeled result
Syrtis type
1.00
0.95
0.90
0.85
Emissivity
Plagioclase 30%
Pyroxene 25%
Calcite 10%
Fe-smectite 10%
Si-K glass 10%
Other 15%
1600
1400
1200
1000
800
600
400
200
Wavenumber (cm-1)


Melas Chasma
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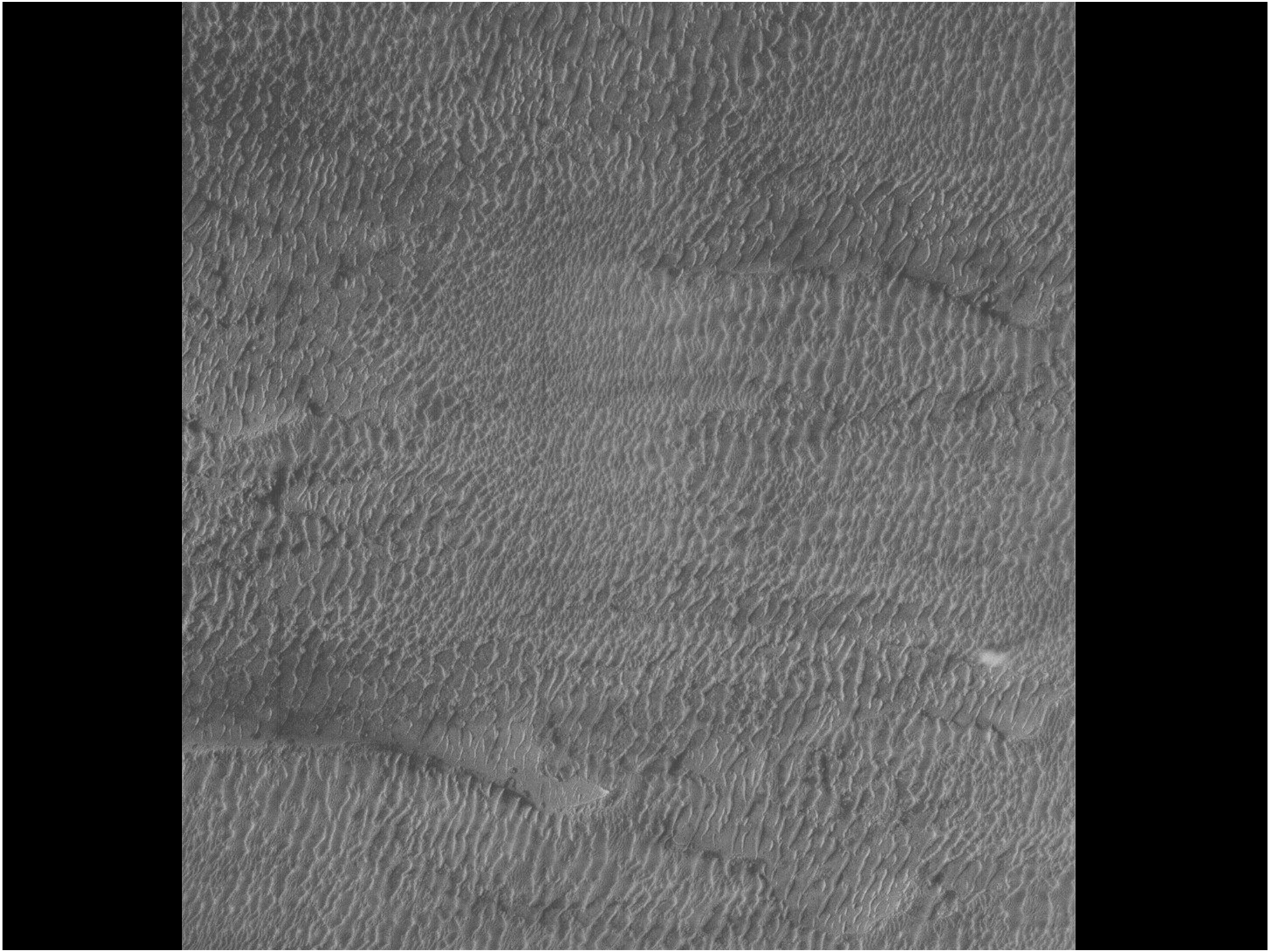
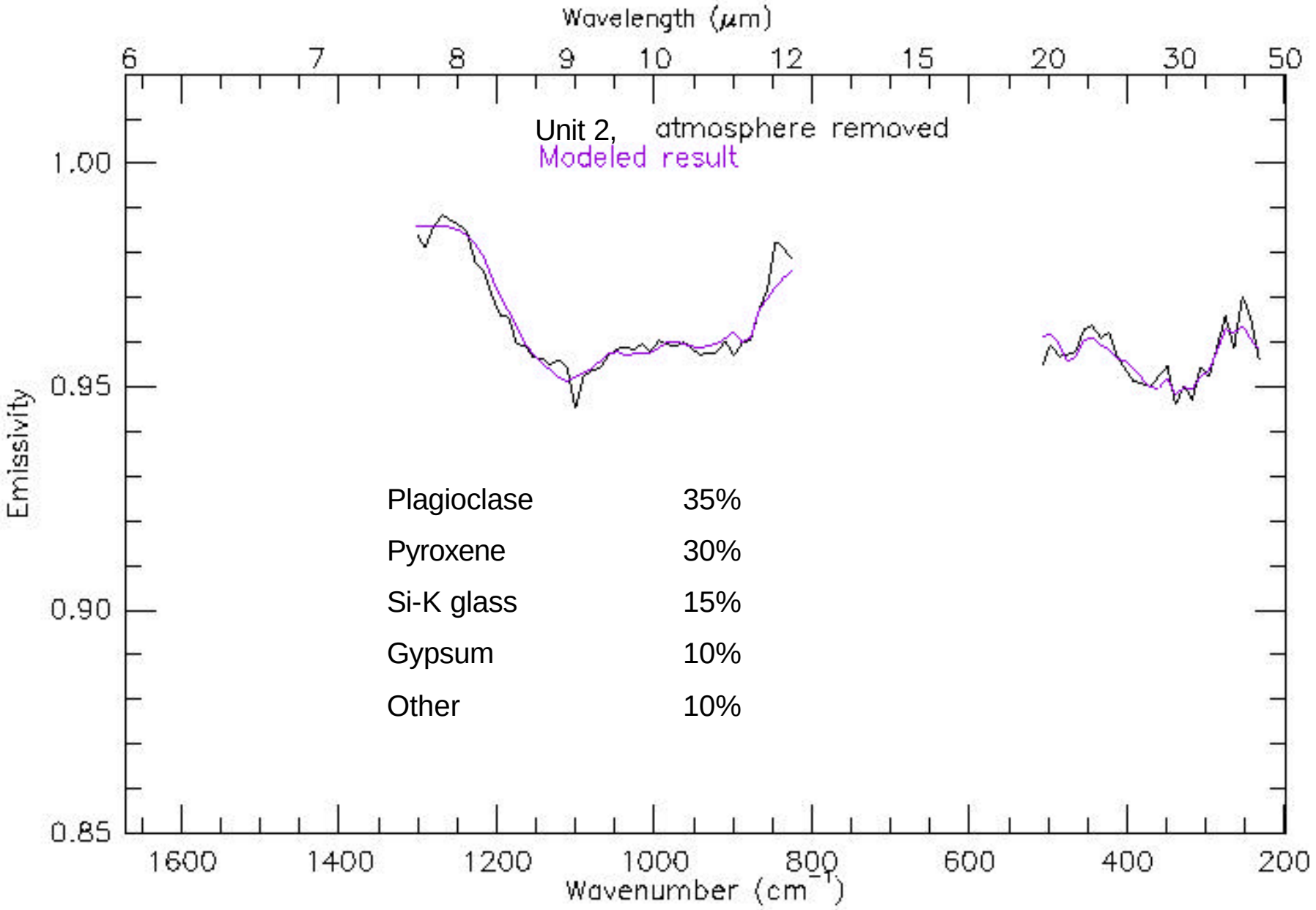
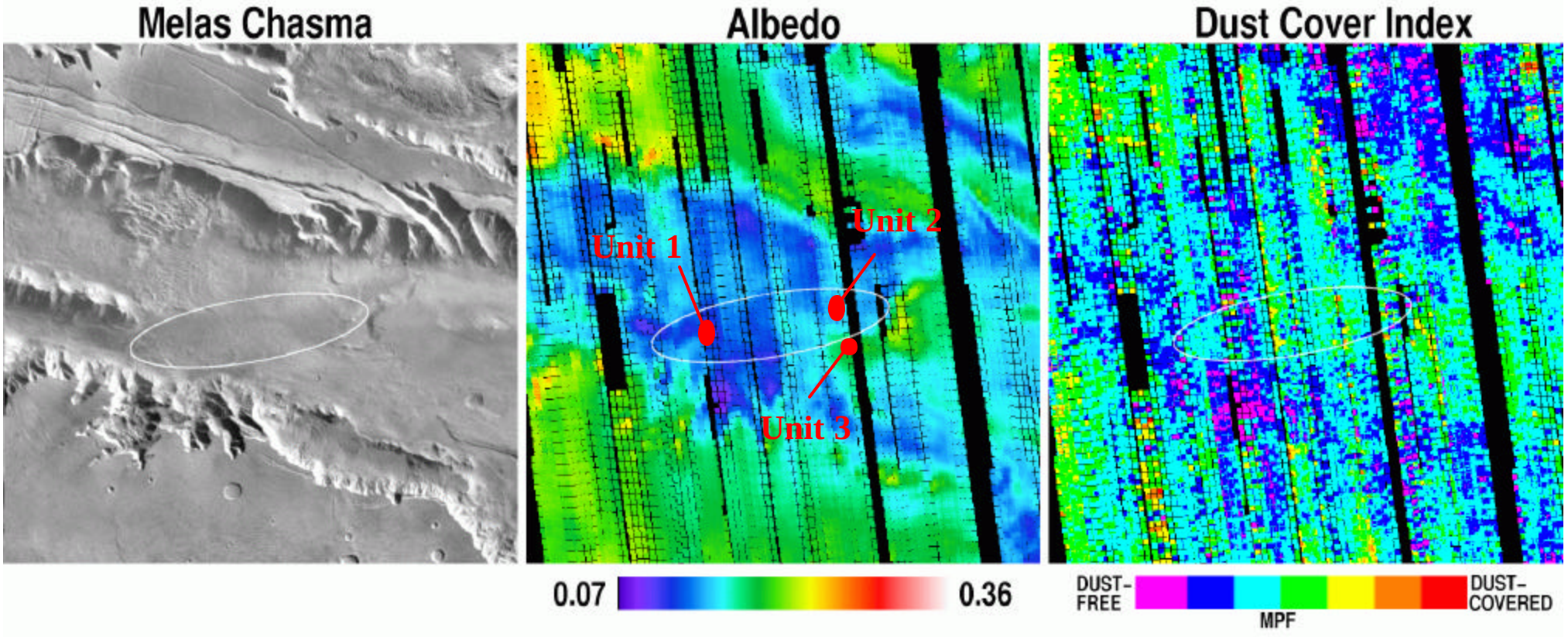
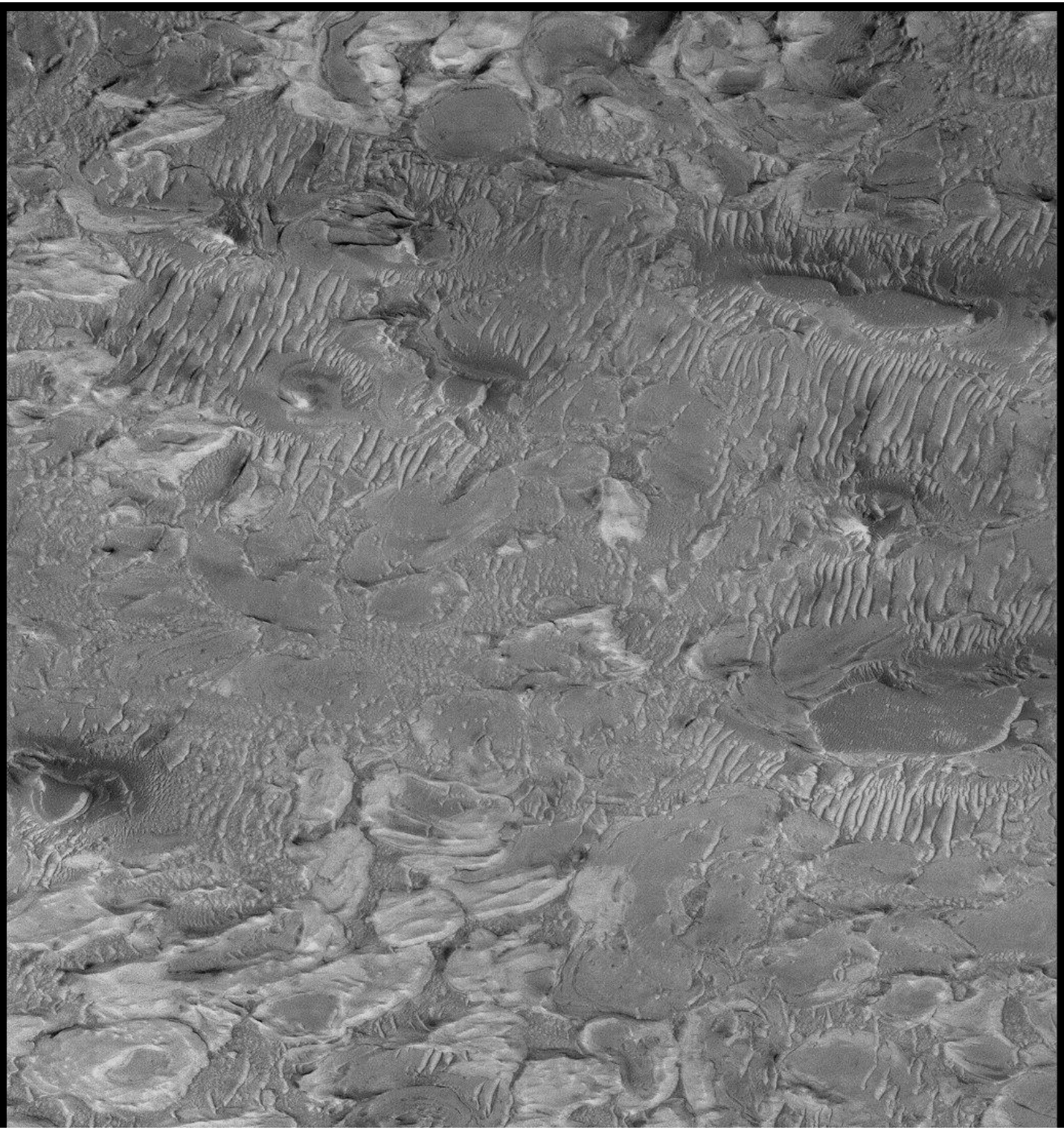
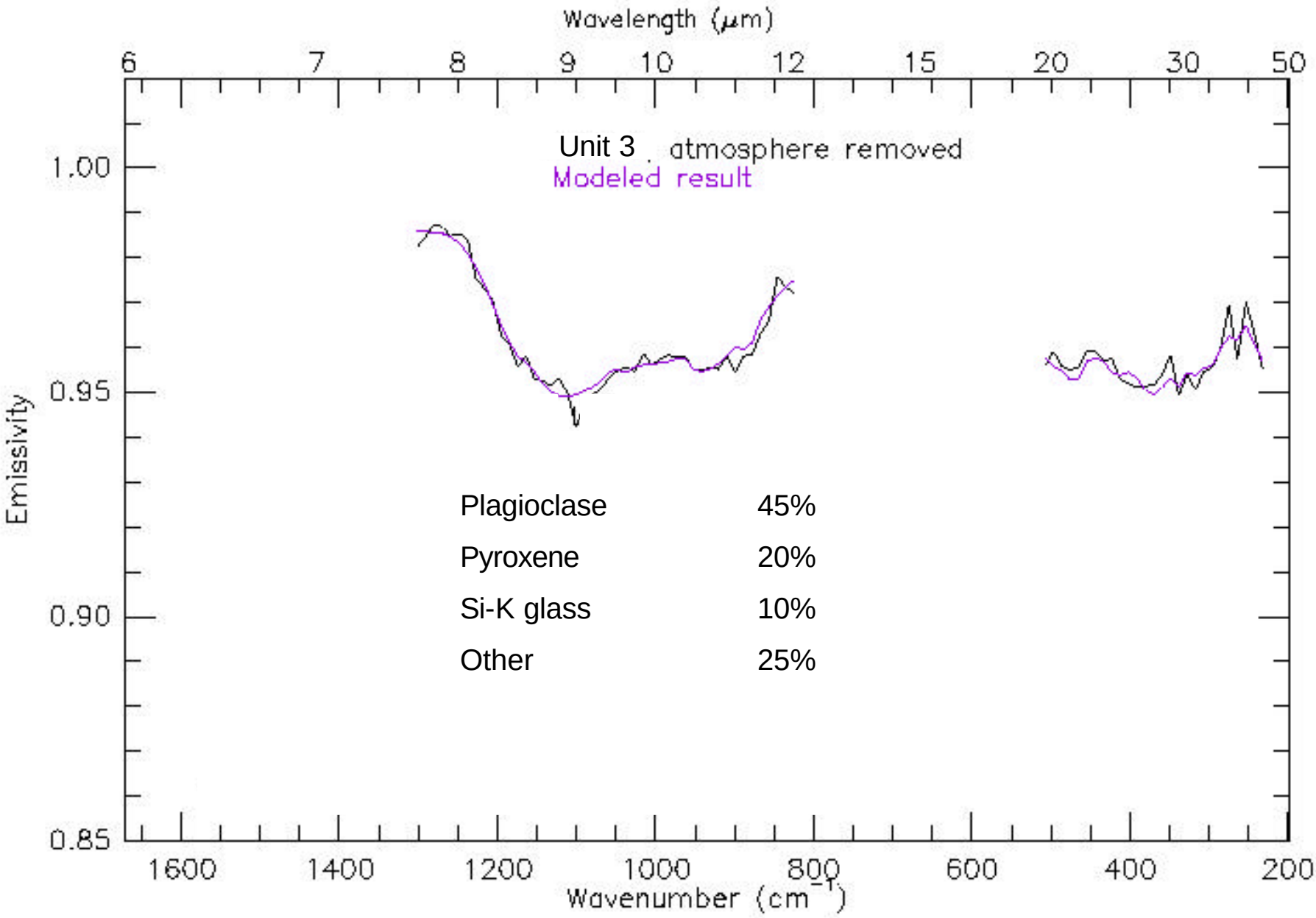
Dust Cover Index
Unit 1
Unit 2
Unit 3
0.07
0.36
DUST-FREE
DUST-COVERED
MPF

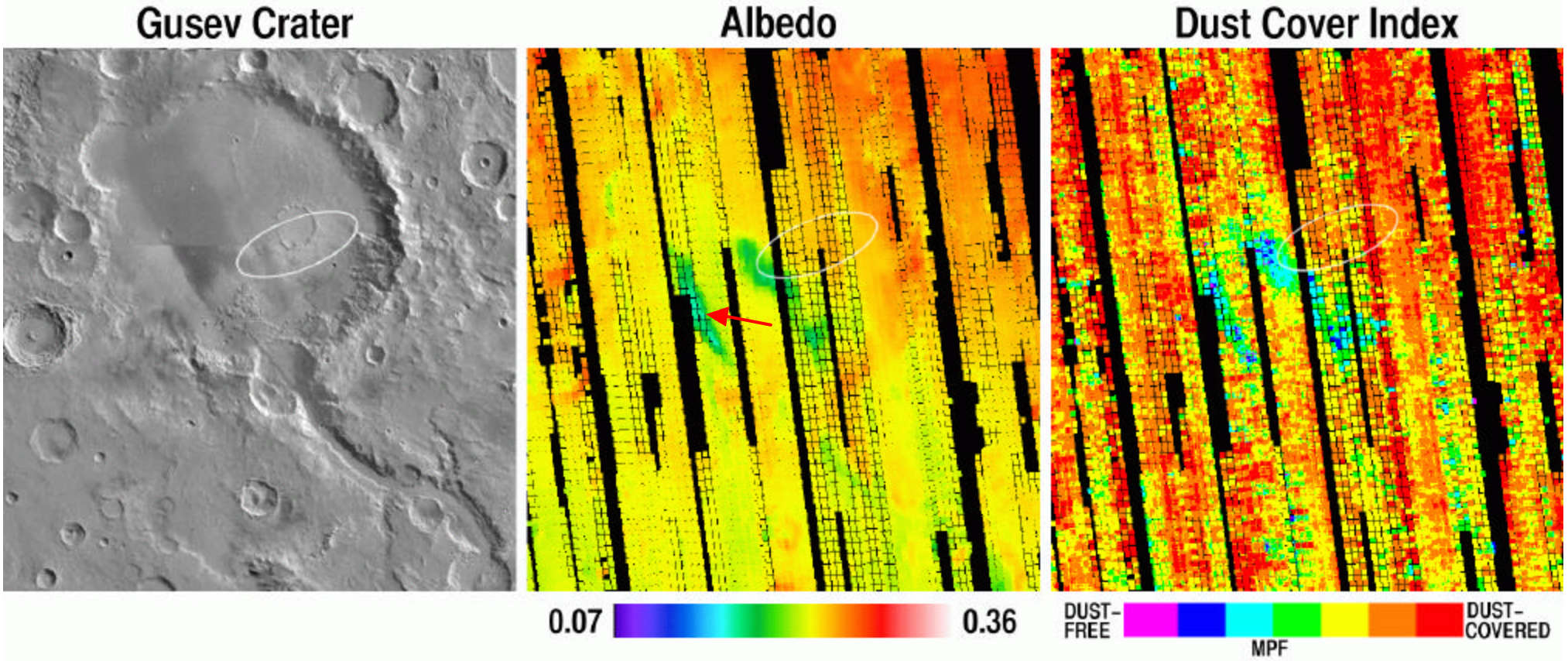


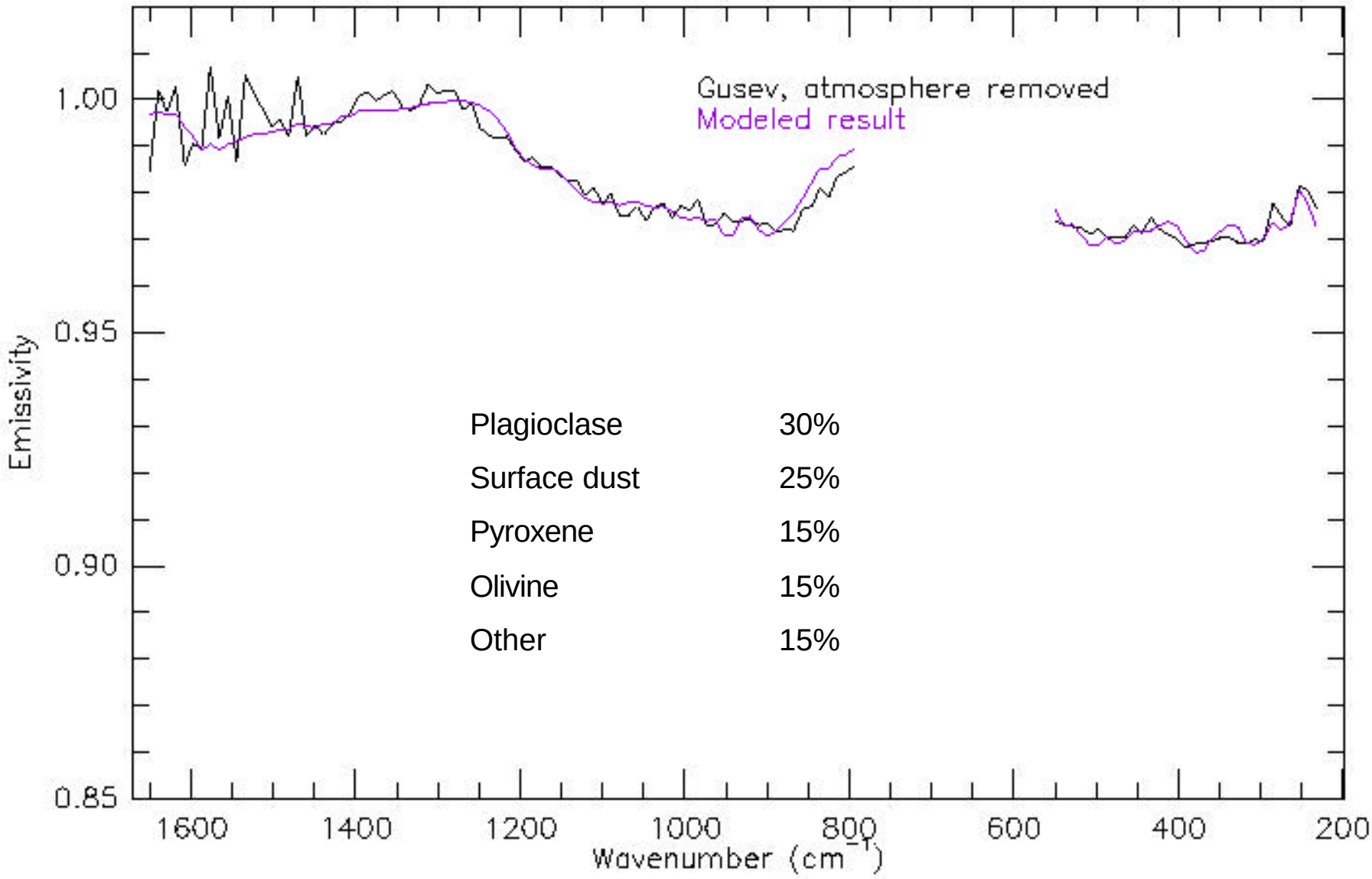

Wavelength (μm)
6
7
8
9
10
12
15
20
30
50
Unit 2, atmosphere removed
Modeled result
1.00
0.95
0.90
0.85
Emissivity
Plagioclase 35%
Pyroxene 30%
Si-K glass 15%
Gypsum 10%
Other 10%
1600
1400
1200
1000
800
600
400
200
Wavenumber (cm-1)

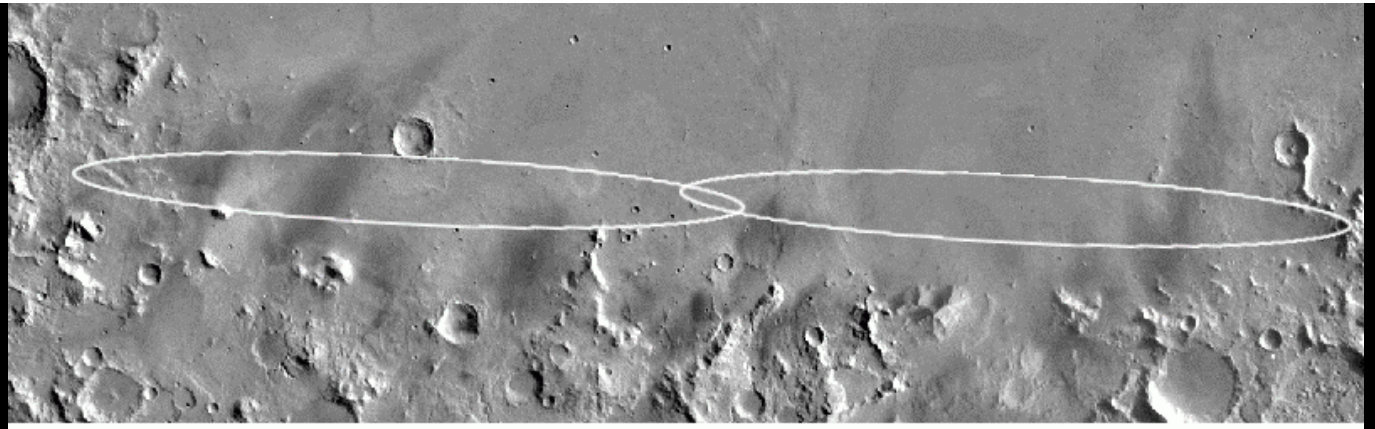

Melas Chasma
Albedo
Dust Cover Index
Unit 1
Unit 2
Unit 3
0.07
0.36
DUST-FREE
DUST-COVERED
MPF



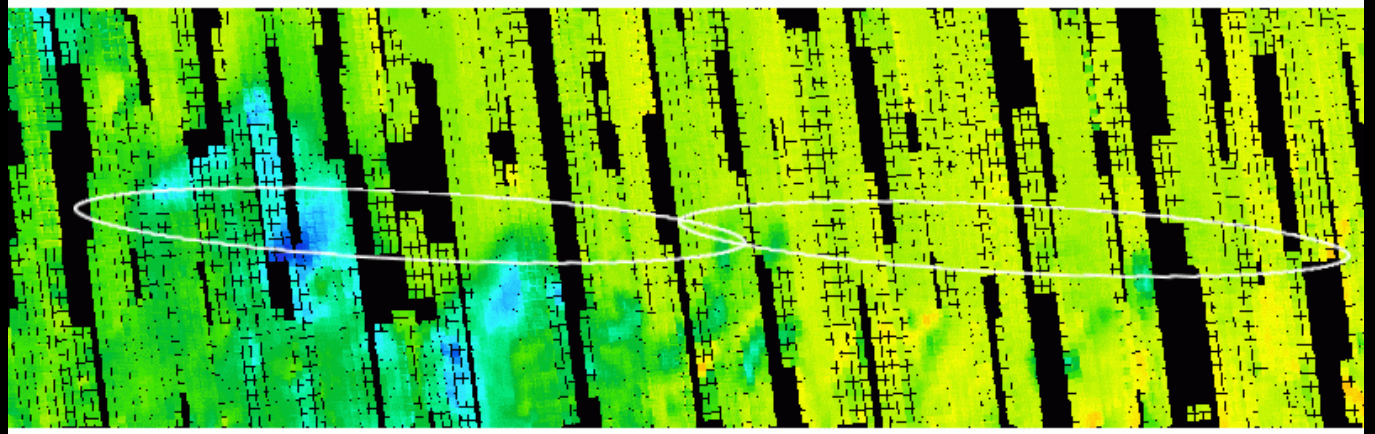

Wavelength (μm)
6
7
8
9
10
12
15
20
30
50
Unit 3 atmosphere removed
Modeled result
1.00
0.95
0.90
0.85
Emissivity
Plagioclase 45%
Pyroxene 20%
Si-K glass 10%
Other 25%
1600
1400
1200
1000
800
600
400
200
Wavenumber (cm-1)


Gusev Crater
Albedo
Dust Cover Index
0.07
0.36
DUST-FREE
DUST-COVERED
MPF

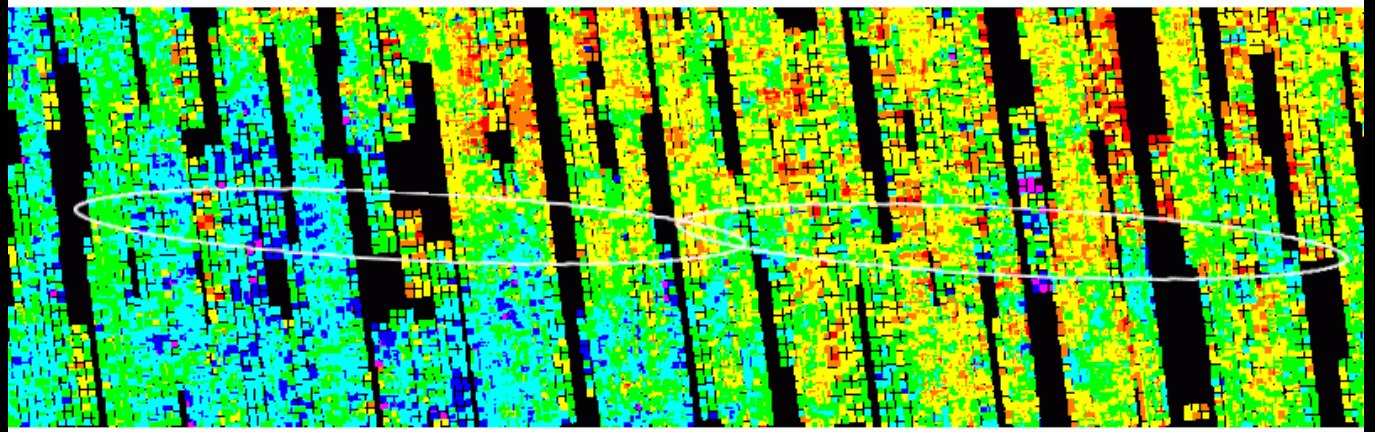

Gusev, atmosphere removed
Modeled result
Plagioclase 30%
Surface dust 25%
Pyroxene 15%
Olivine 15%
Other 15%
Emissivity
1.00
0.95
0.90
0.85
1600
1400
1200
1000
800
600
400
200
Wavenumber (cm-1)



Isidis Planitia

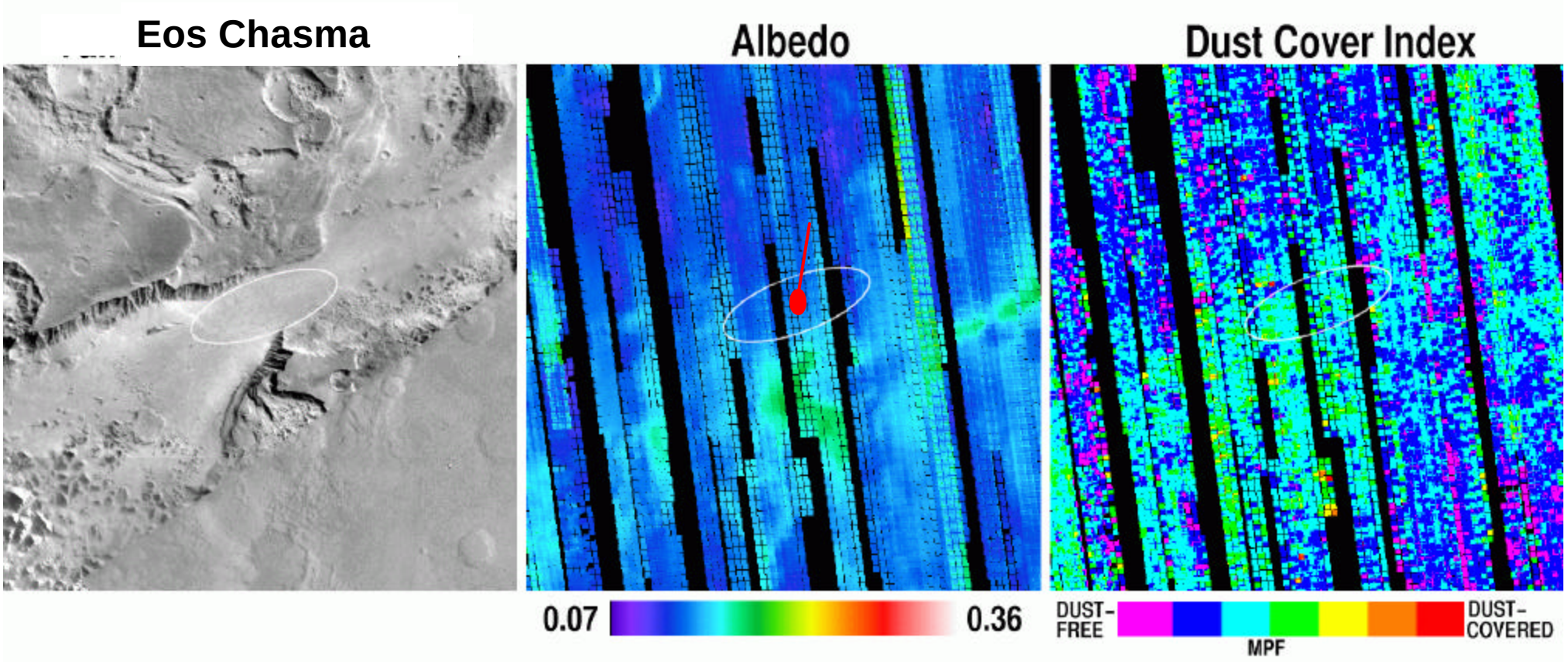


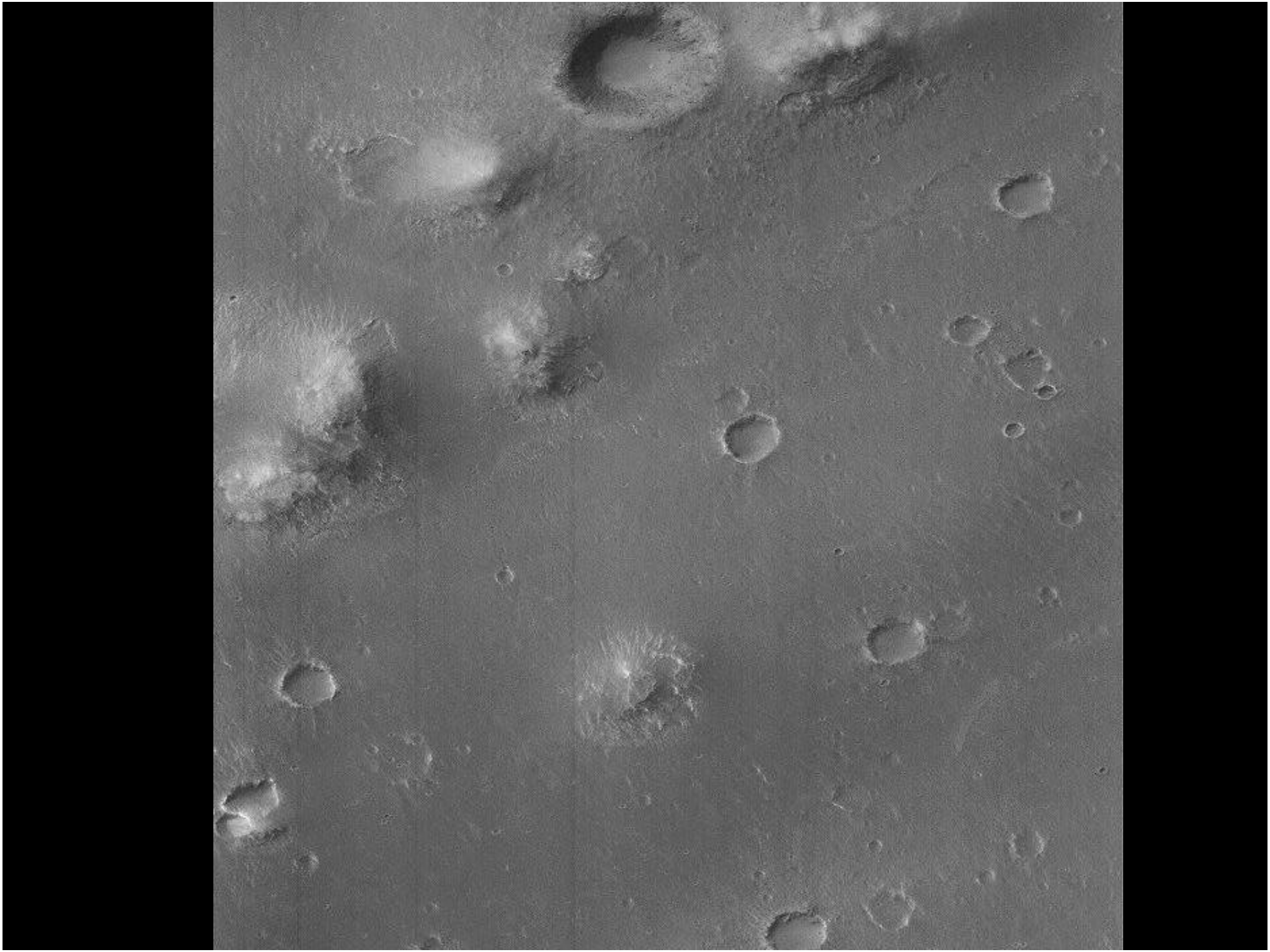
Albedo 0.07 0.36

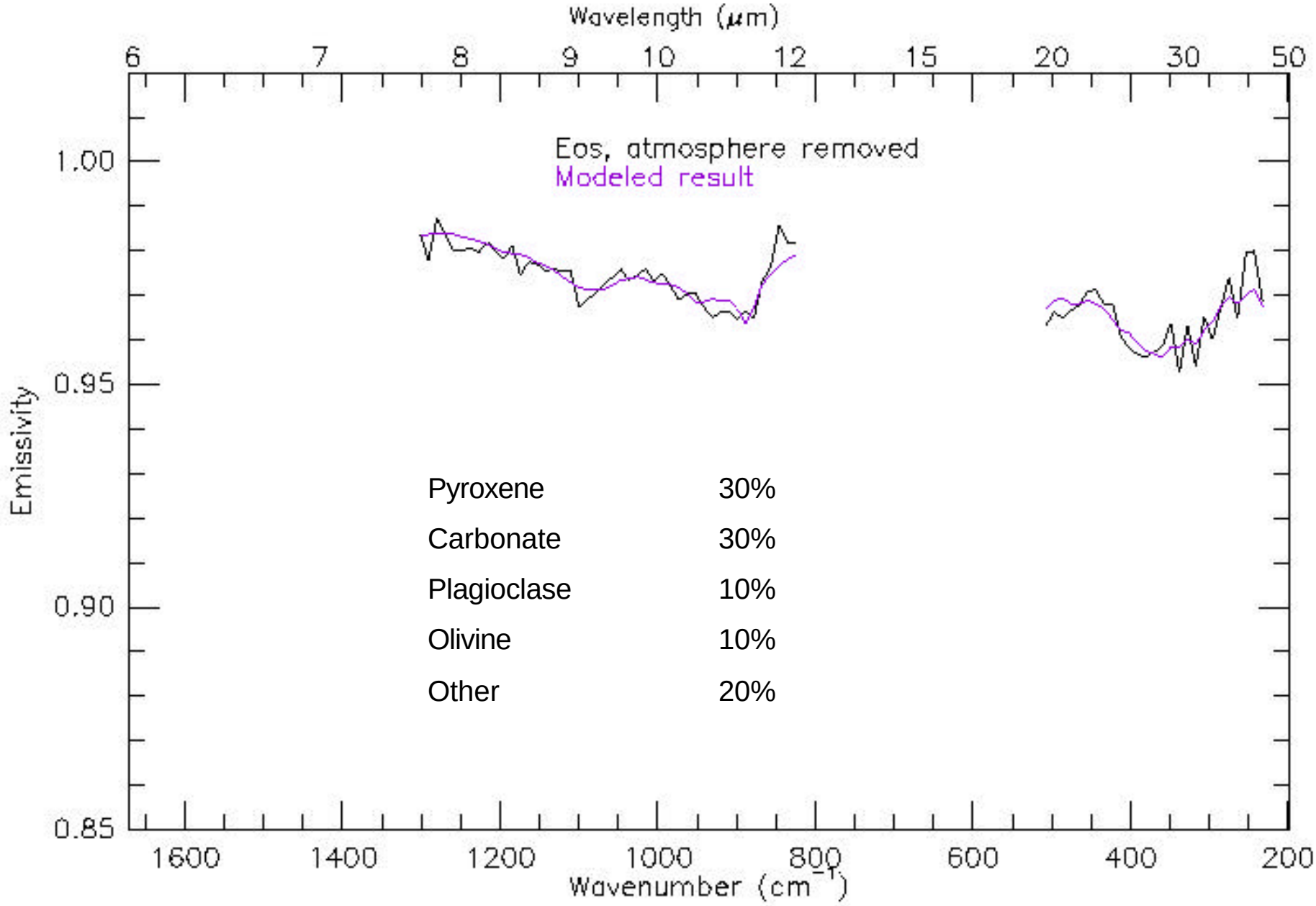


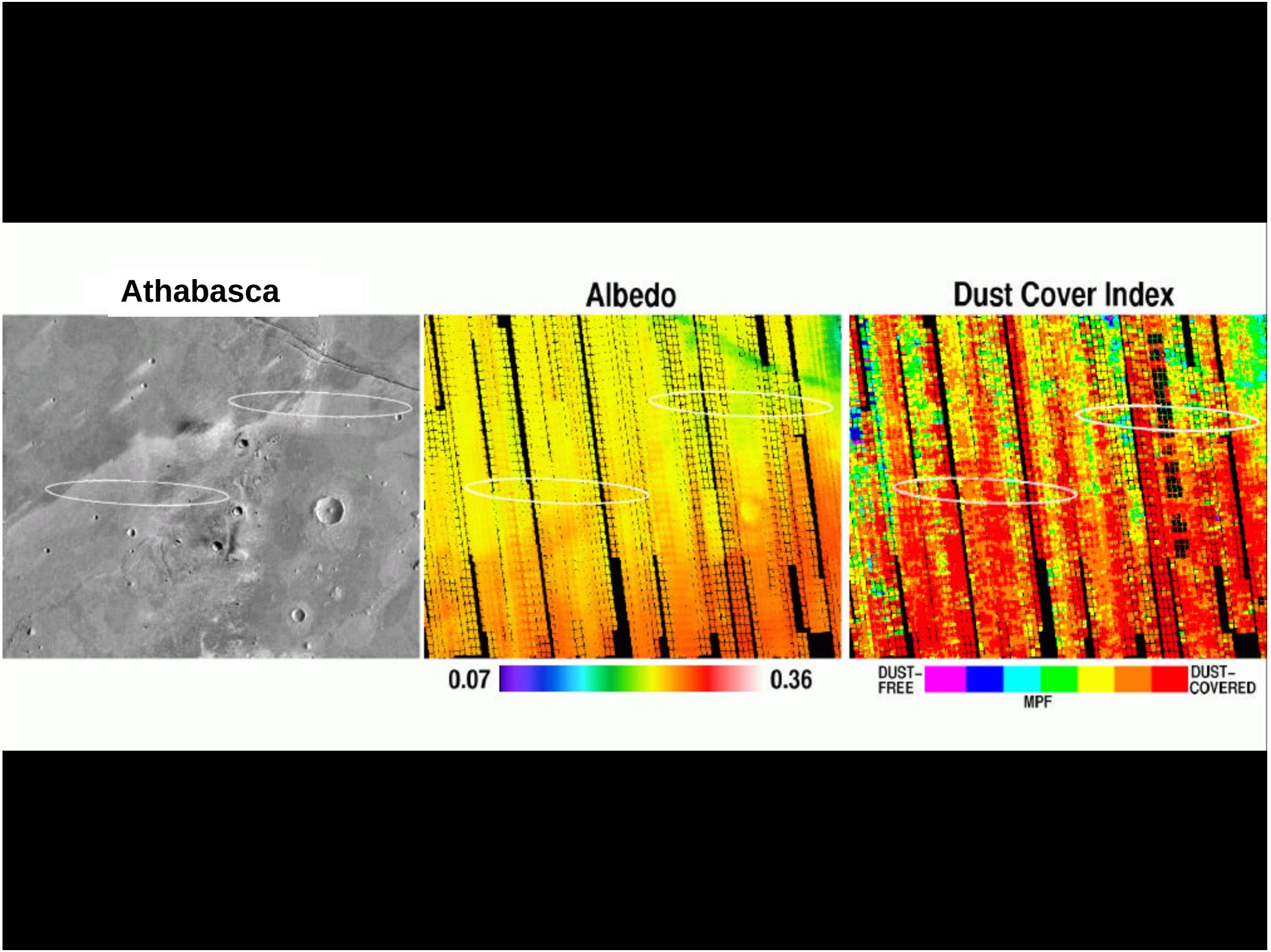
Dust Cover DUST-FREE DUST-COVERED

MPF


Eos Chasma
Albedo
Dust Cover Index
0.07
0.36
DUST-FREE
MPF
DUST-COVERED




Wavelength (μm)
6
7
8
9
10
12
15
20
30
50
Eos, atmosphere removed
Modeled result
1.00
0.95
0.90
0.85
Emissivity
Pyroxene 30%
Carbonate 30%
Plagioclase 10%
Olivine 10%
Other 20%
1600
1400
1200
1000
800
600
400
200
Wavenumber (cm-1)


Athabasca
Albedo
Dust Cover Index
0.07
0.36
DUST-FREE
DUST-COVERED
MPF