SAGE III MESOSPHERIC OZONE RETRIEVAL
(v02.00 Status)

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- Mesospheric Ozone Retrieval (Status):
    - Current Version (v02.00)
    - Ongoing and Planned Investigations

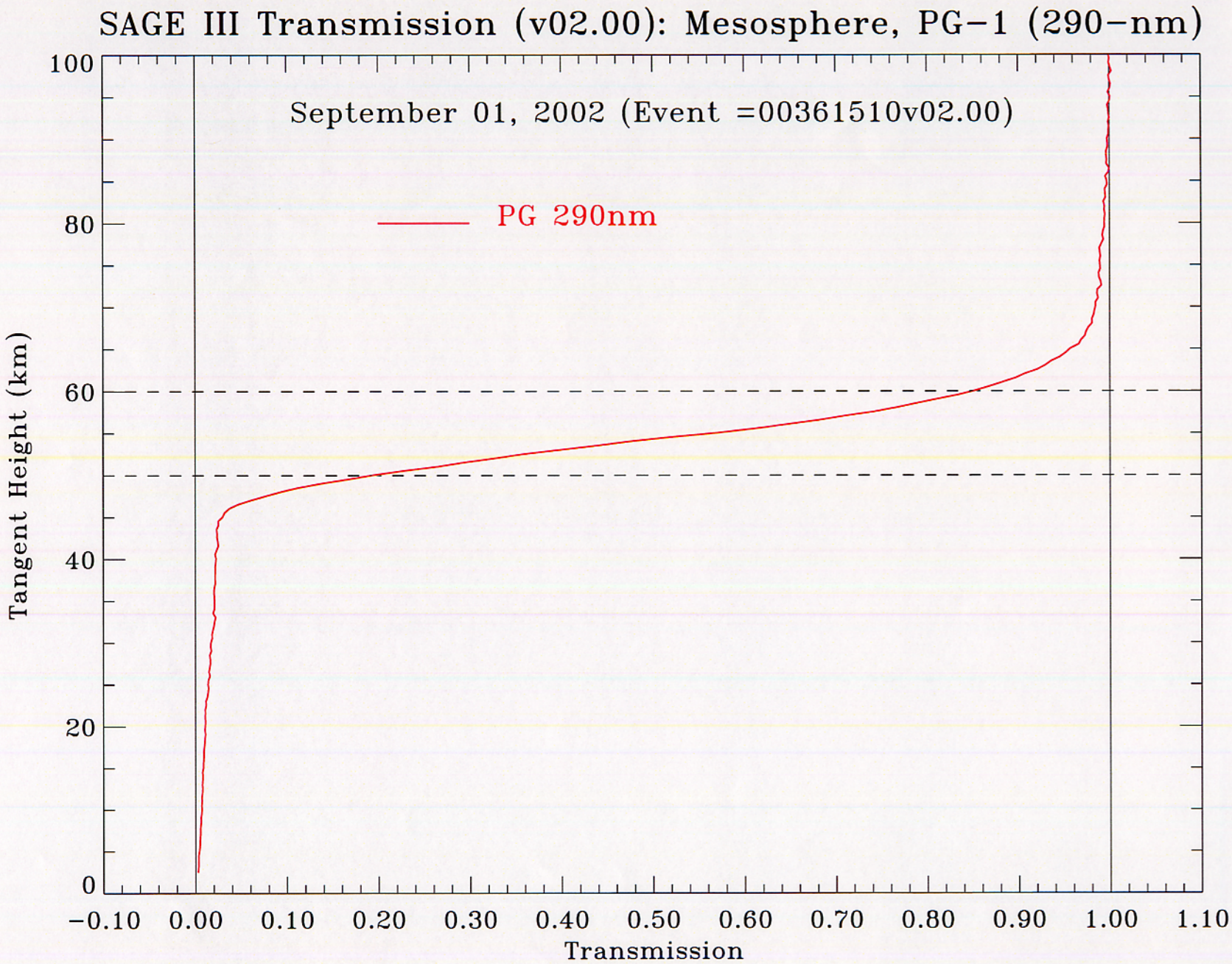
- Pixel Group No. 1 (290-nm):

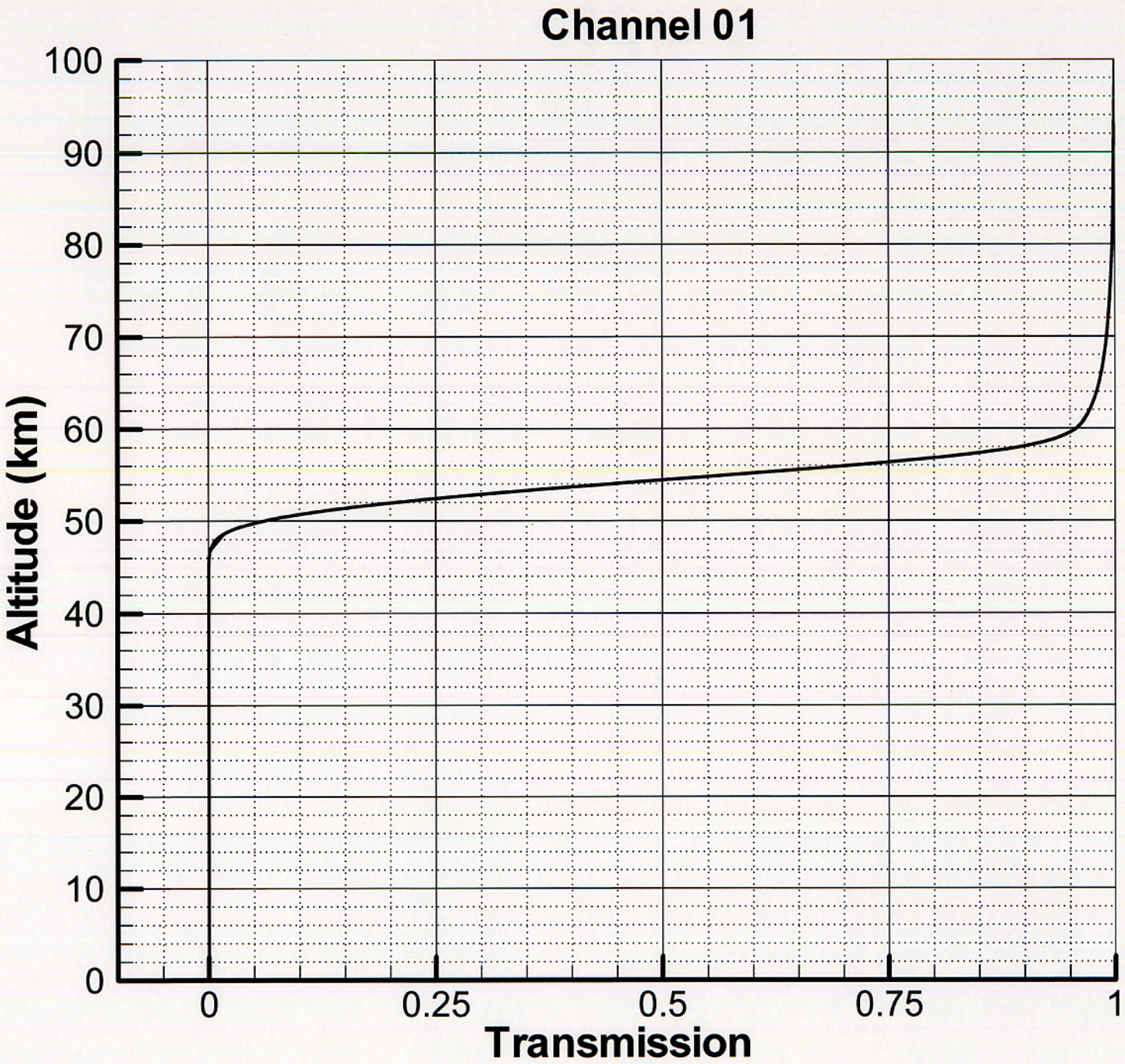
Pixel No.	Wavelength (nm)
001	287.73
002	288.66
003	289.60
004	290.54
005	291.47
006	292.41

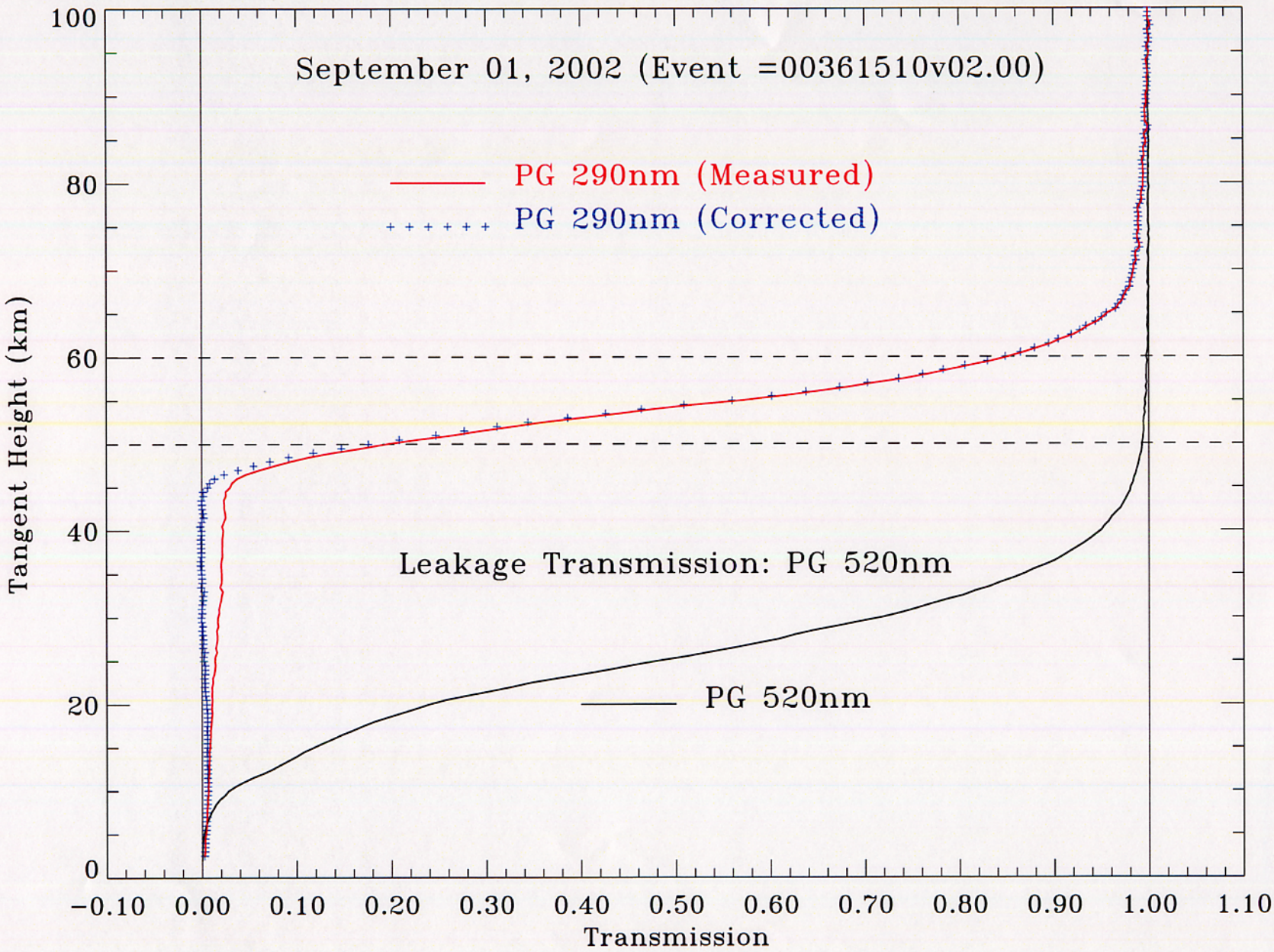
- Mesospheric O_3 Pixel Groups (284, 290, 296 nm):

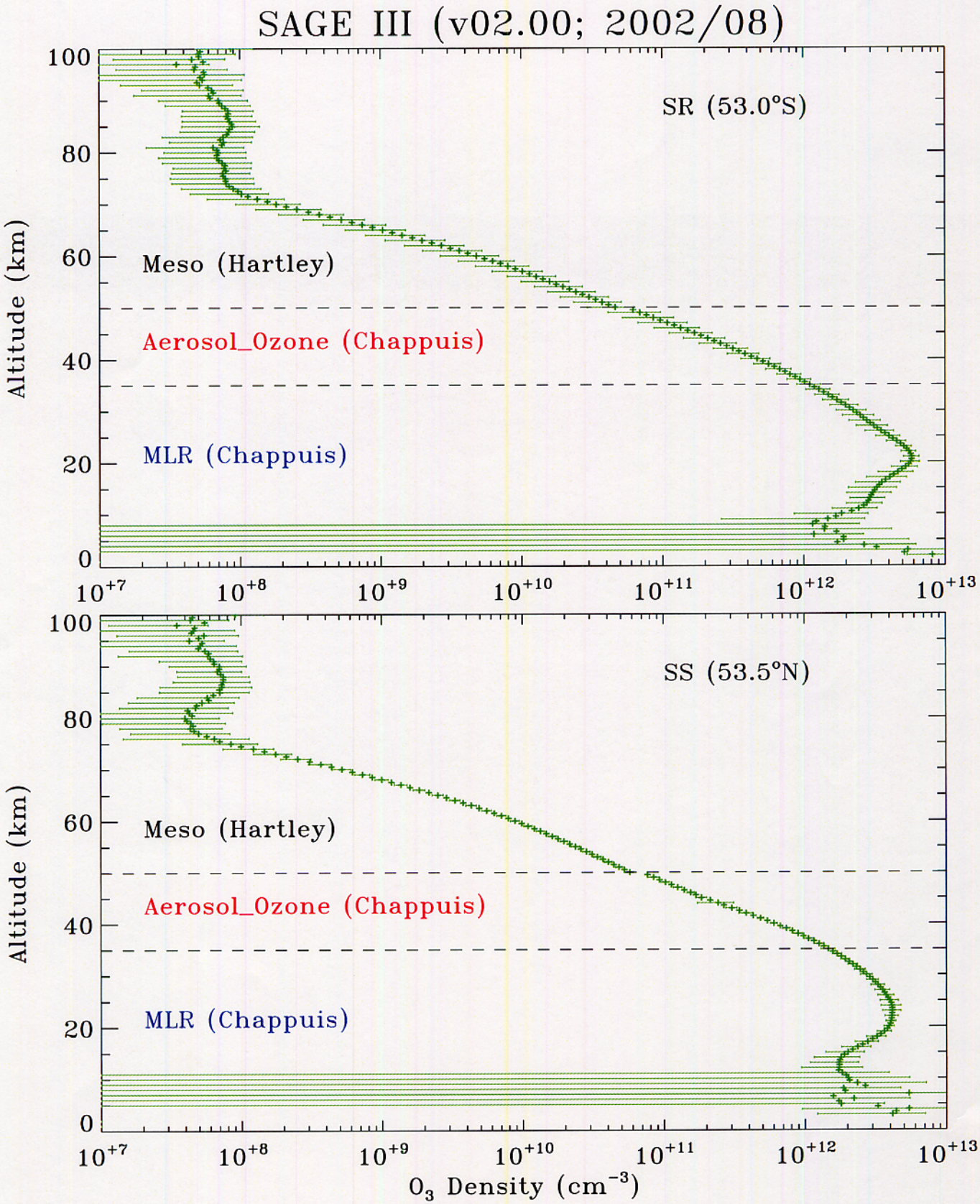
	Pixel No.	Wavelength (nm)	
PG-1 (284 nm)	001	282.10	Available After 2/26/03
	002	283.04	
	003	283.98	
	004	284.91	
	005	285.85	
	006	286.79	
PG-2 (290 nm)	007	287.73	
	008	288.66	
	009	289.60	
	010	290.54	
	011	291.47	
	012	292.41	
PG-3 (296 nm)	013	293.35	Available After 2/26/03
	014	294.28	
	015	295.22	
	016	296.16	
	017	297.09	
	018	298.03	
	019	298.97	

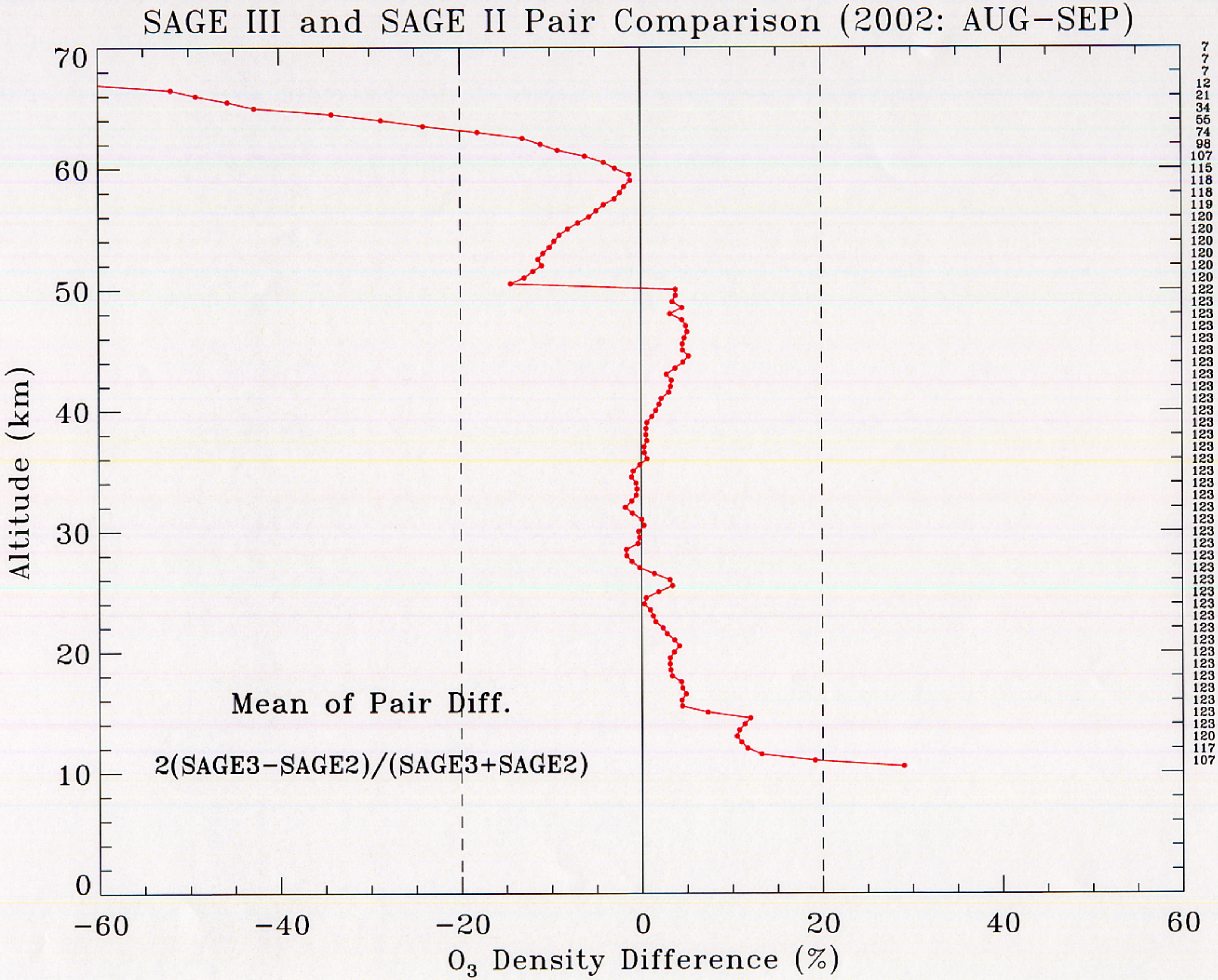
- Mesospheric Ozone Retrieval Algorithm (v02.00):
  - Transmission Leakage Correction (L.T. Model)
  - 290-nm SPOD Calculation (Optically Thin SP Formulation)
  - Molecular Contribution Removal (Climatology)
  - Vertical Profile Inversion


SAGE III Transmission (v02.00): Mesosphere, PG−1 (290−nm)
September 01, 2002 (Event =00361510v02.00)
PG 290nm
Tangent Height (km)
100
80
60
40
20
0
−0.10
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70
0.80
0.90
1.00
1.10
Transmission


Channel 01
Altitude (km)
100
90
80
70
60
50
40
30
20
10
0
0
0.25
0.5
0.75
1
Transmission

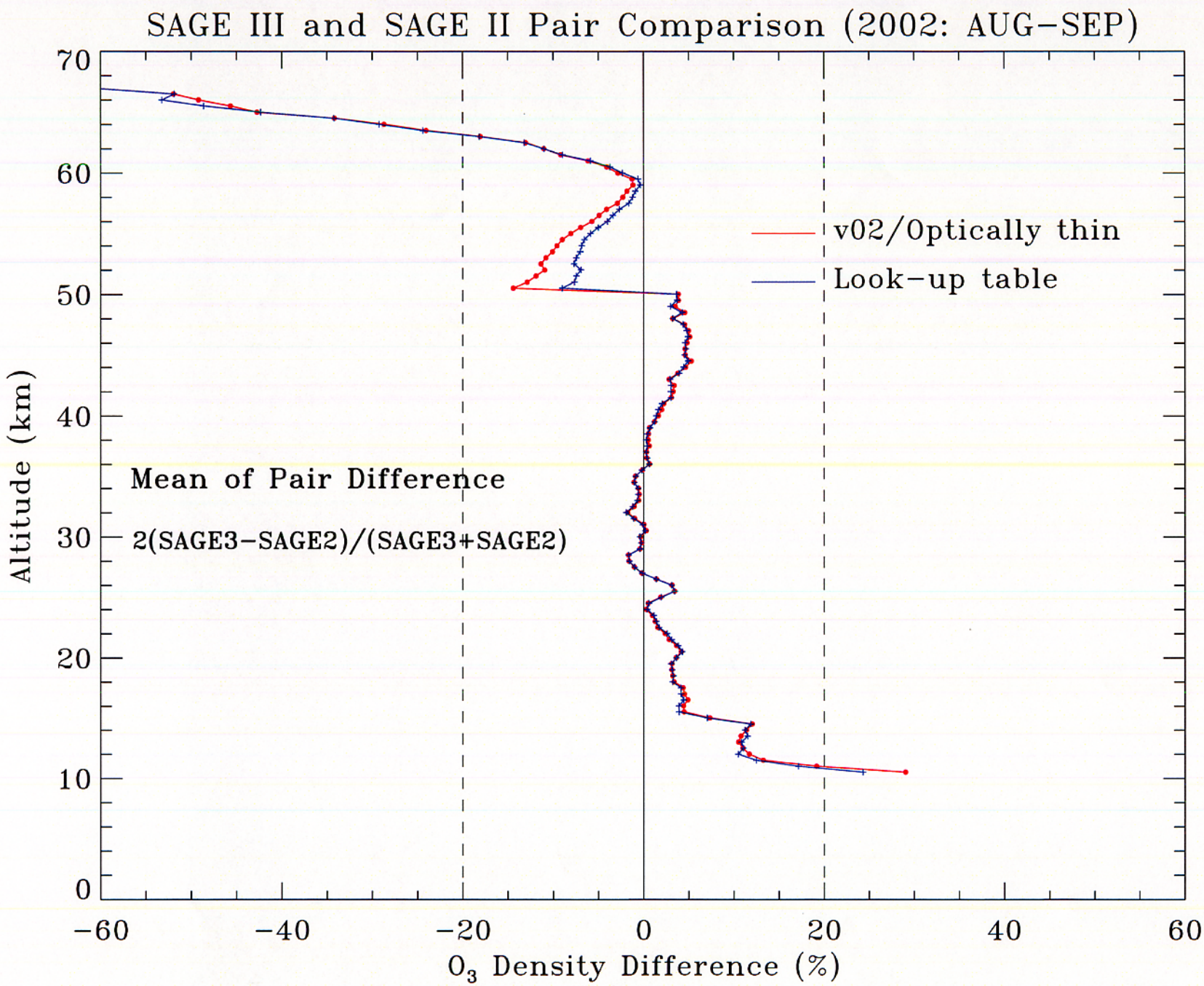

September 01, 2002 (Event =00361510v02.00)
PG 290nm (Measured)
PG 290nm (Corrected)
Leakage Transmission: PG 520nm
PG 520nm
Tangent Height (km)
Transmission
100
80
60
40
20
0
−0.10
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70
0.80
0.90
1.00
1.10


SAGE III (v02.00; 2002/08)
SR (53.0°S)
SS (53.5°N)
Meso (Hartley)
Aerosol_Ozone (Chappuis)
MLR (Chappuis)
Altitude (km)
0
20
40
60
80
100
10^{+7}
10^{+8}
10^{+9}
10^{+10}
10^{+11}
10^{+12}
10^{+13}
O_3 Density (cm^{-3})

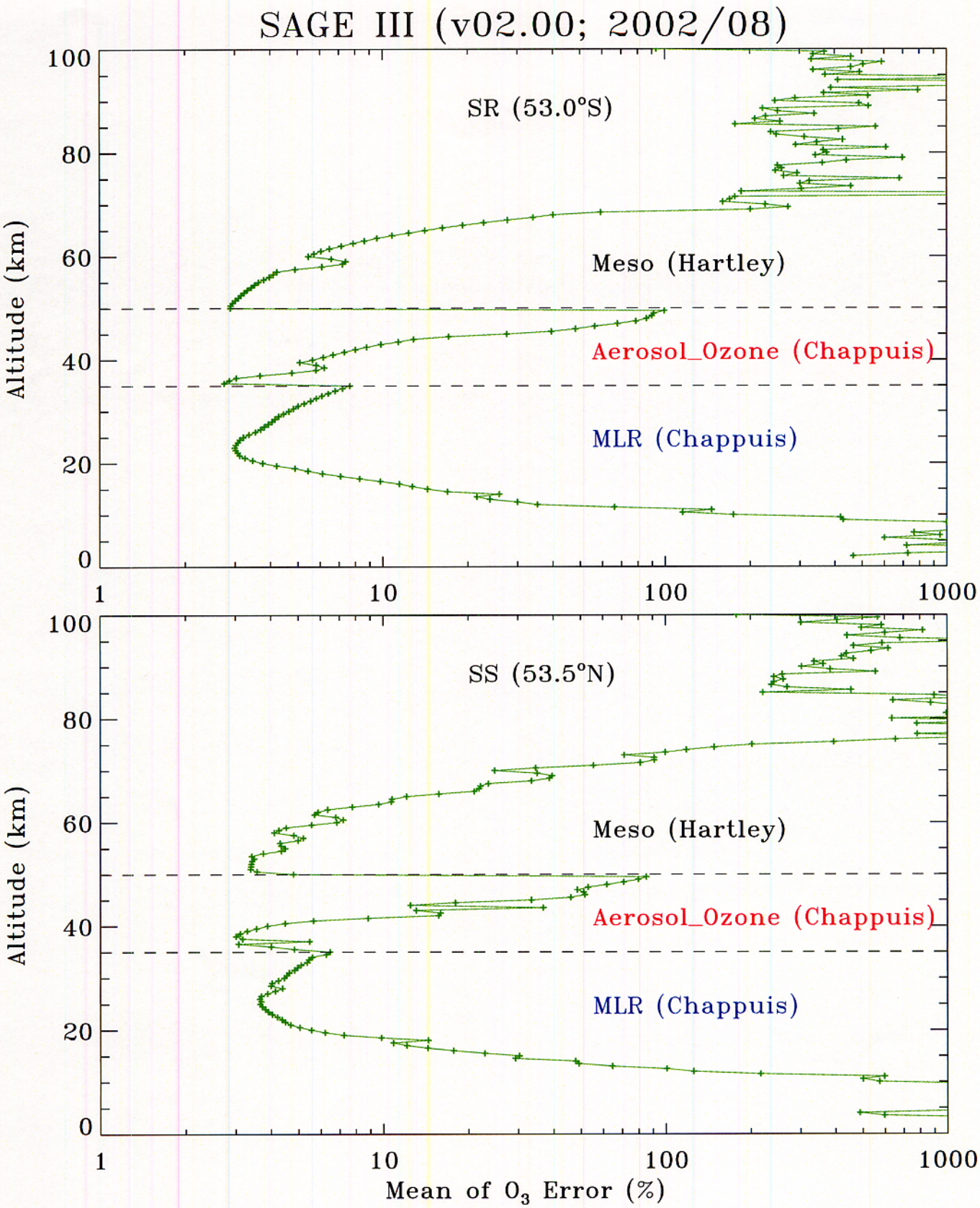


SAGE III and SAGE II Pair Comparison (2002: AUG–SEP)
Altitude (km)
O3 Density Difference (%)
Mean of Pair Diff.
2(SAGE3–SAGE2)/(SAGE3+SAGE2)

- Possible Reasons for Profile Discontinuity at 50 km:
  - Optically Thin Slant Path Formulation (290 SPOD)
  - Transmission Leakage Correction (undercorrect)
  - O_3 PG−1 (290 nm) Absorption X−Section (Spectral Response Function/Pixel Saturation)
  - ??? (Unknown Factors)


SAGE III and SAGE II Pair Comparison (2002: AUG–SEP)
v02/Optically thin
Look–up table
Mean of Pair Difference
2(SAGE3–SAGE2)/(SAGE3+SAGE2)
Altitude (km)
O_3 Density Difference (%)
70
60
50
40
30
20
10
0
–60
–40
–20
0
20
40
60

- Error Estimate:
  - Error Source:
    - Transmission Uncertainty
    - O_3 Absorption Cross Section
    - Molecular Contribution at 290-nm
  - Error Calculation:
    - Bevington (1969)


SAGE III (v02.00; 2002/08)
SR (53.0°S)
Meso (Hartley)
Aerosol_Ozone (Chappuis)
MLR (Chappuis)
SS (53.5°N)
Meso (Hartley)
Aerosol_Ozone (Chappuis)
MLR (Chappuis)
Altitude (km)
Altitude (km)
0
20
40
60
80
100
1
10
100
1000
Mean of O_3 Error (%)

- Ongoing and Planned Investigations:
  - Investigation on the Ozone Profile Discontinuity at 50 km
    - Meso–O_3 Data Comparison (Haloe, POAM III, μWave, Saber, etc.)
    - Leakage Correction Sensitivity Study
    - O_3 X–Section/Spectral Response Function Sensitivity Study
  - 3–PG (284–, 290–, 296–nm) Mesospheric Ozone Retrieval (Transmission Measurement Available Since 2–26–2003)
  - Potential Additional Measurements at 300–nm Region