Non-LTE Calculation of Sunspot Spectra Based on Optically-Thick Semiempirical Modeling

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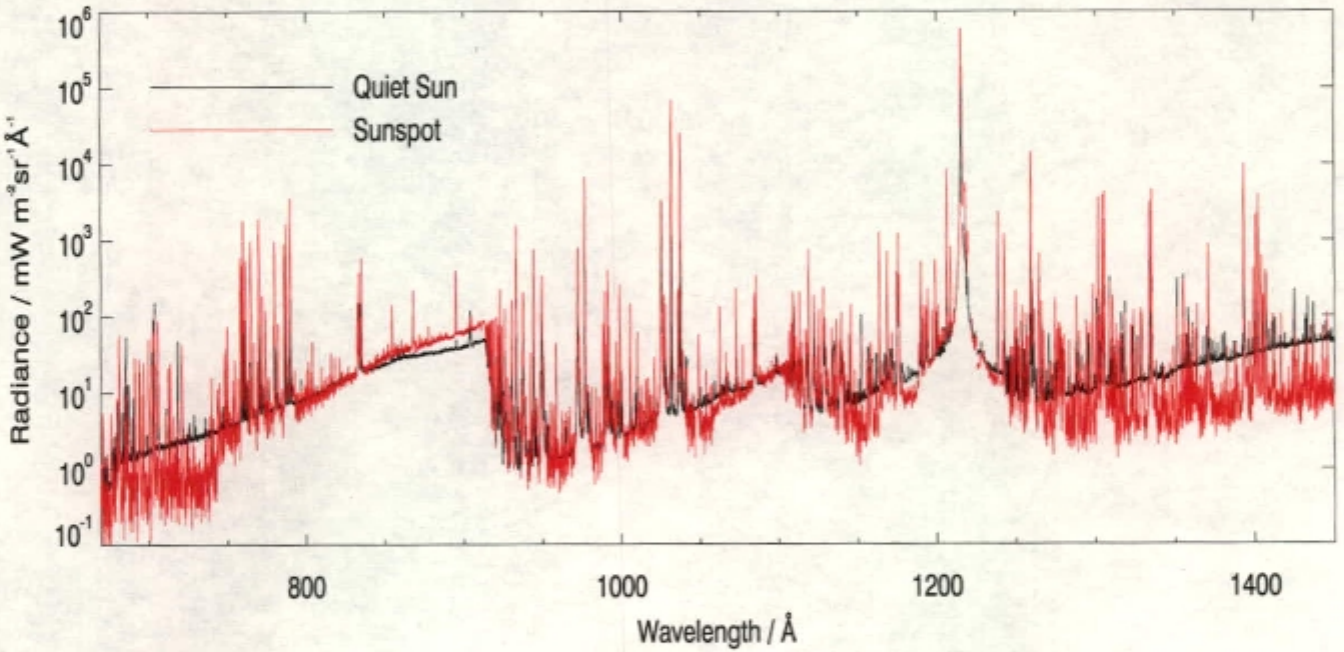


Fig. 1.— caption

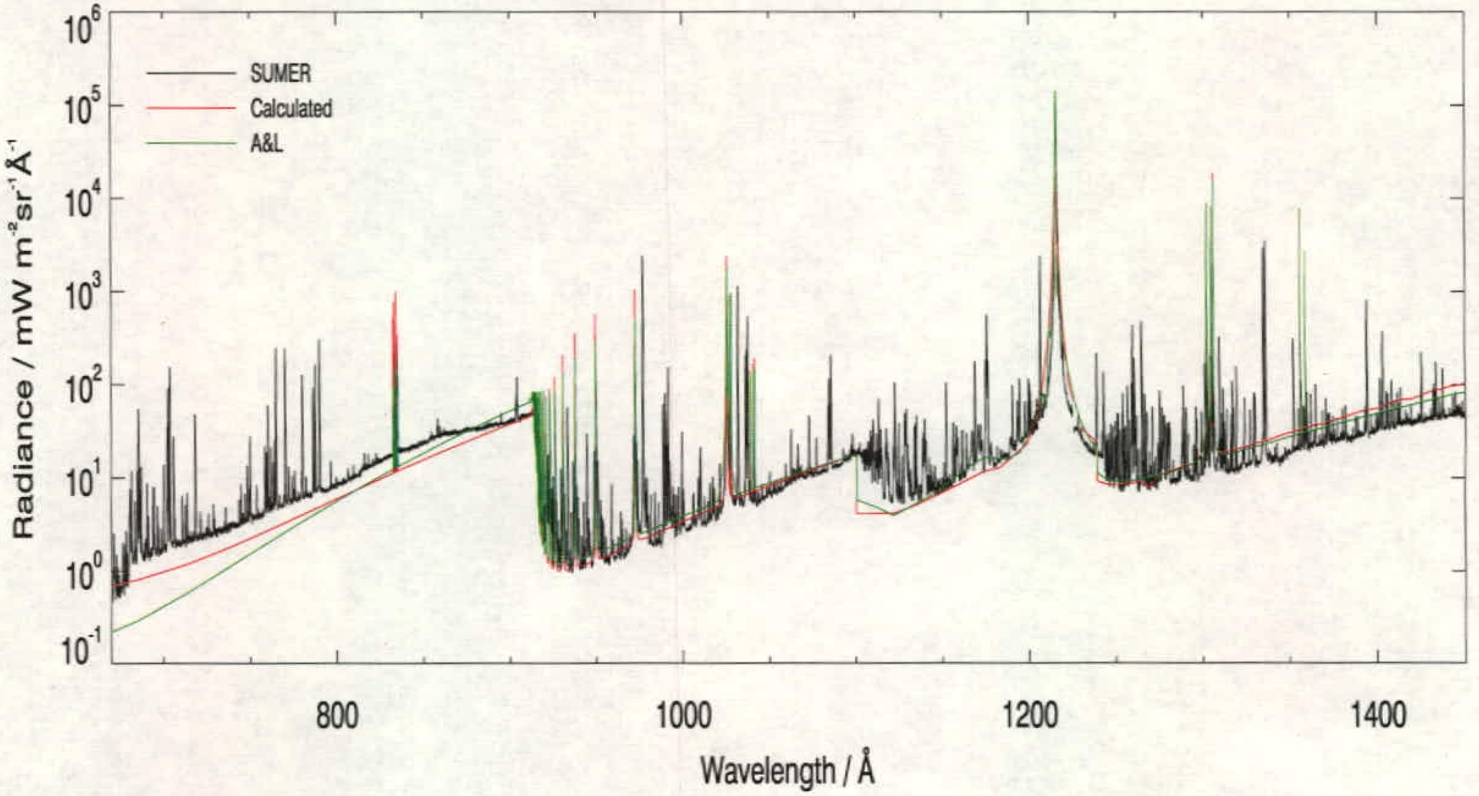


Fig. 2.— caption

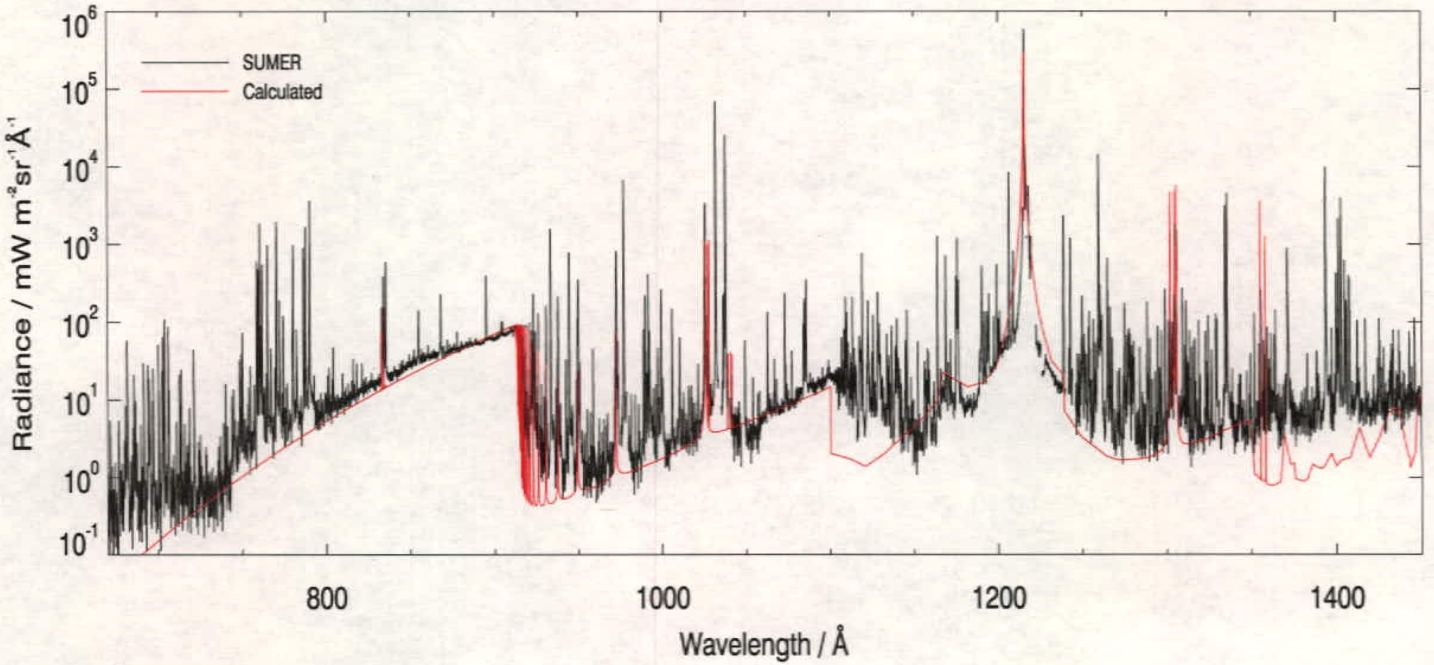
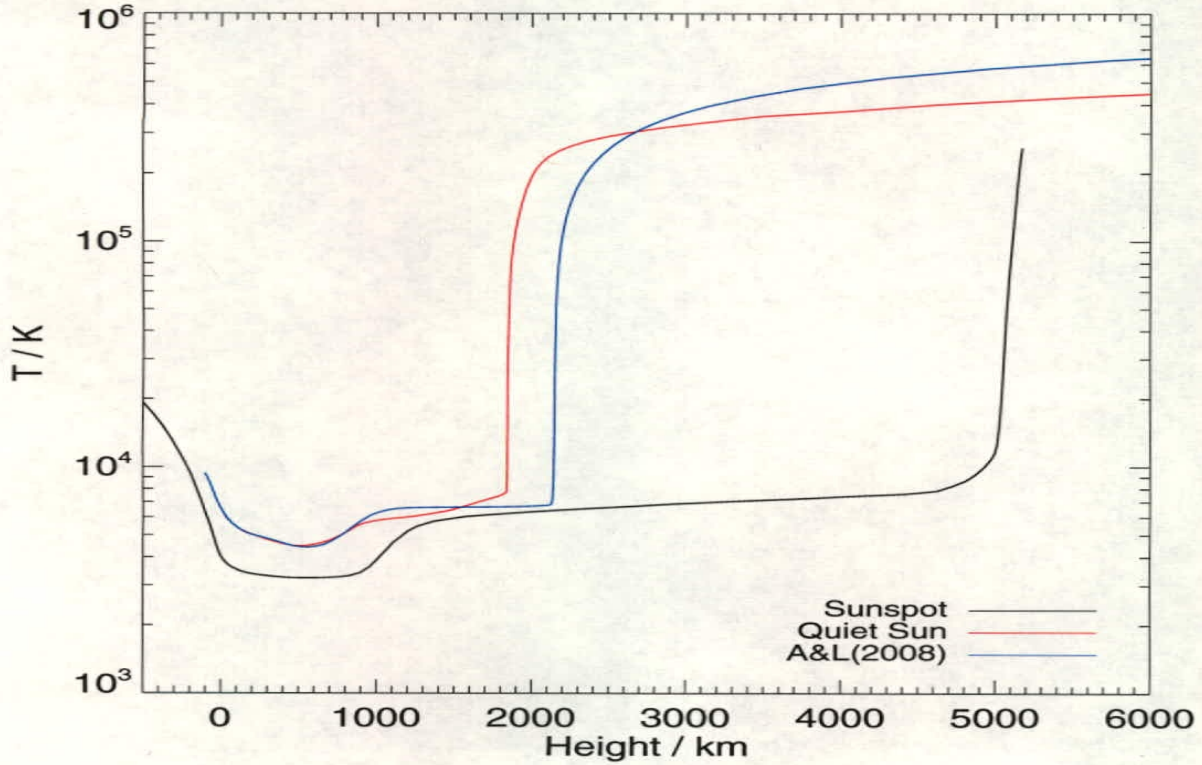


Fig. 3.— caption


10^6
10^5
10^4
10^3
T / K
0
1000
2000
3000
4000
5000
6000
Height / km
Sunspot
Quiet Sun
A&L(2008)

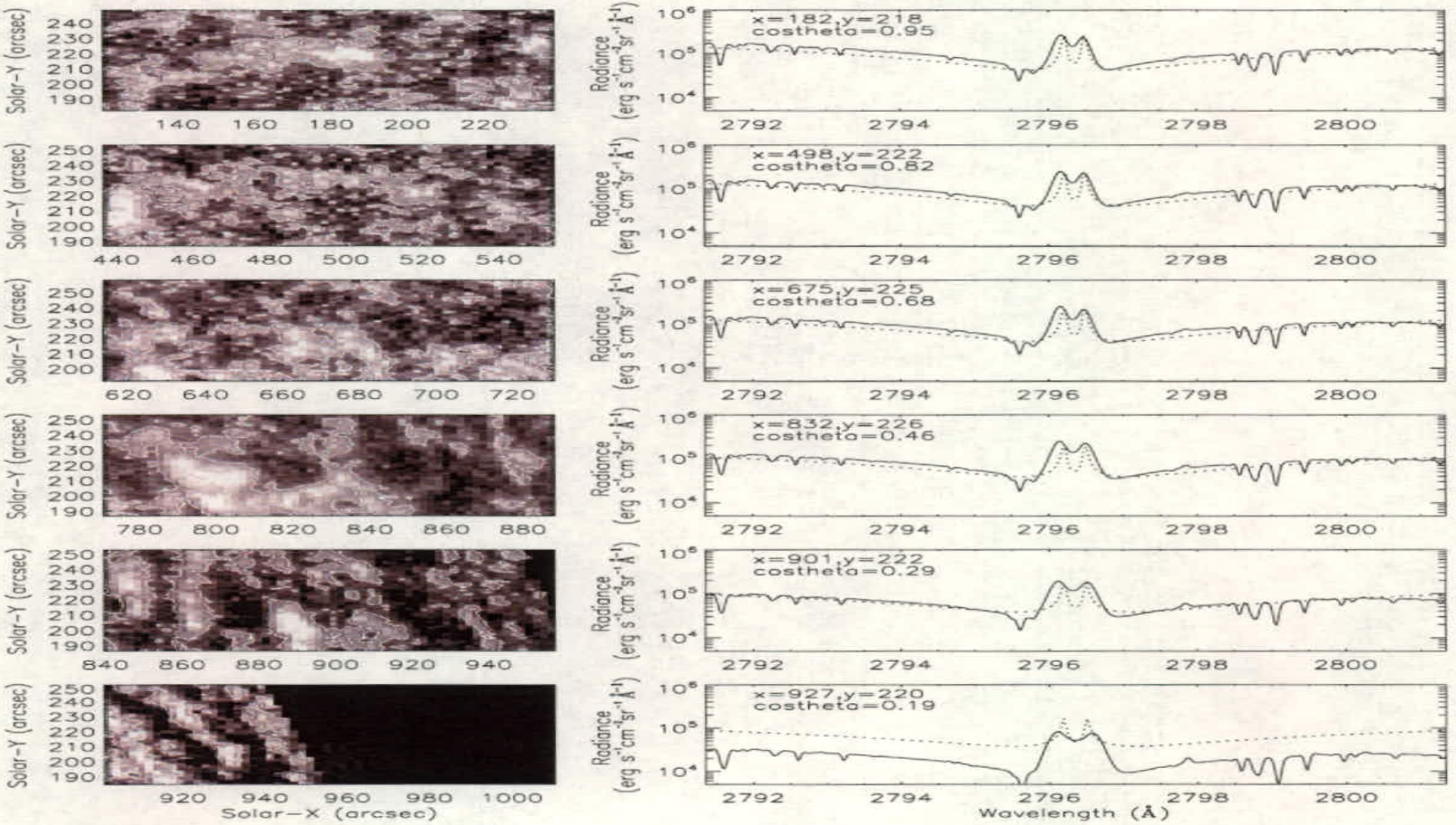


Fig. 4.— **Left:**: Mg II wind images integrated over the 2791.35-2792.63 Åwavelength range at different μ angles. The contours outline the sunspot umbra. **Right:** IRIS Mg II k line profiles average within the contours (solid lines) are compared with the model output of the quiet Sun (dotted and dashed lines). The coordinates (x,y) and μ values ($\cos\theta$) are also marked in the right panels.

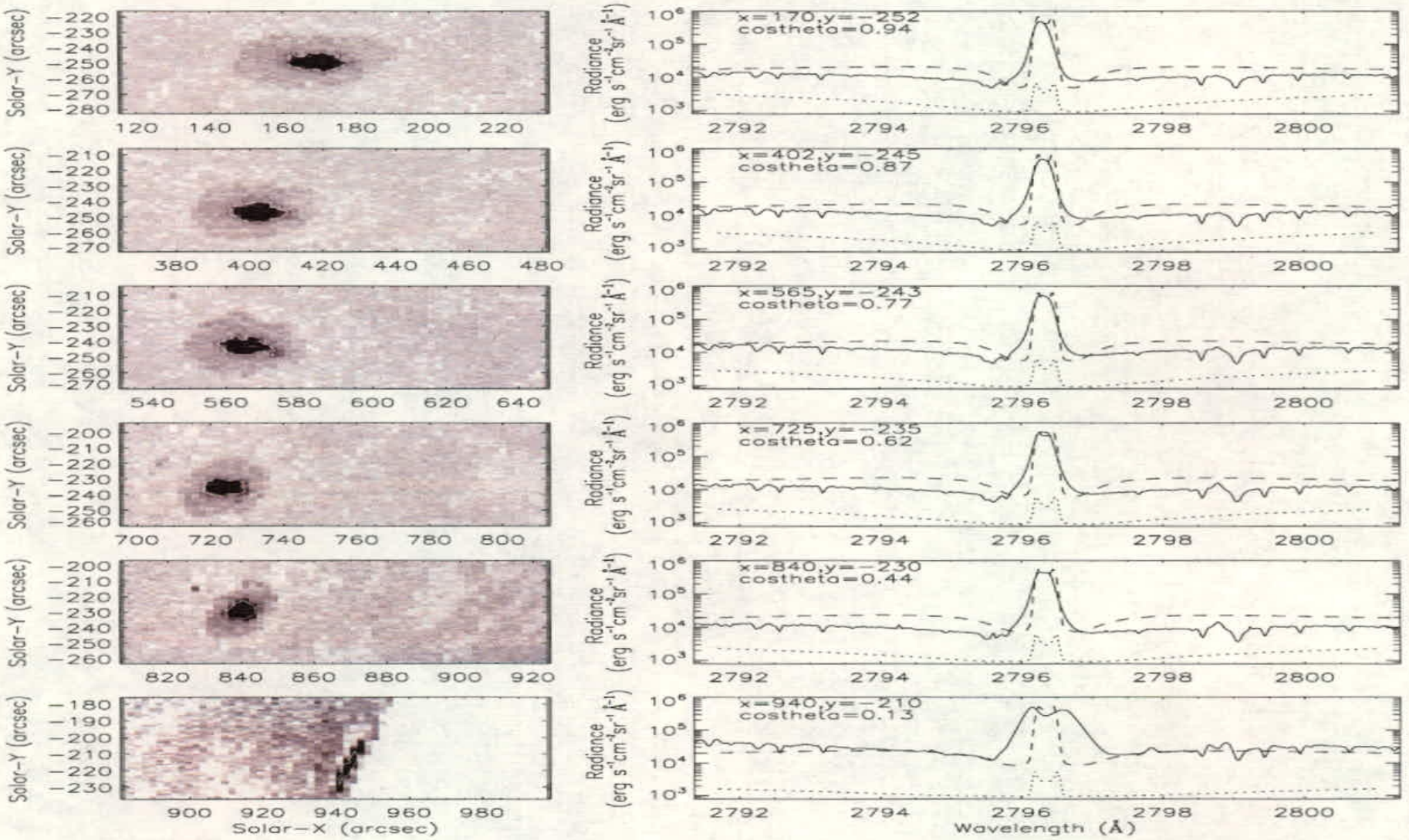


Fig. 5.— Mg II wind images at different μ angles. The contours outline the quiet Sun network. **Right:** IRIS Mg II k line profiles averaged within the contours (solid lines) are compared with model output (dotted lines). The coordinates (x,y) and μ values ($\cos\theta$) are also marked in the right panels.

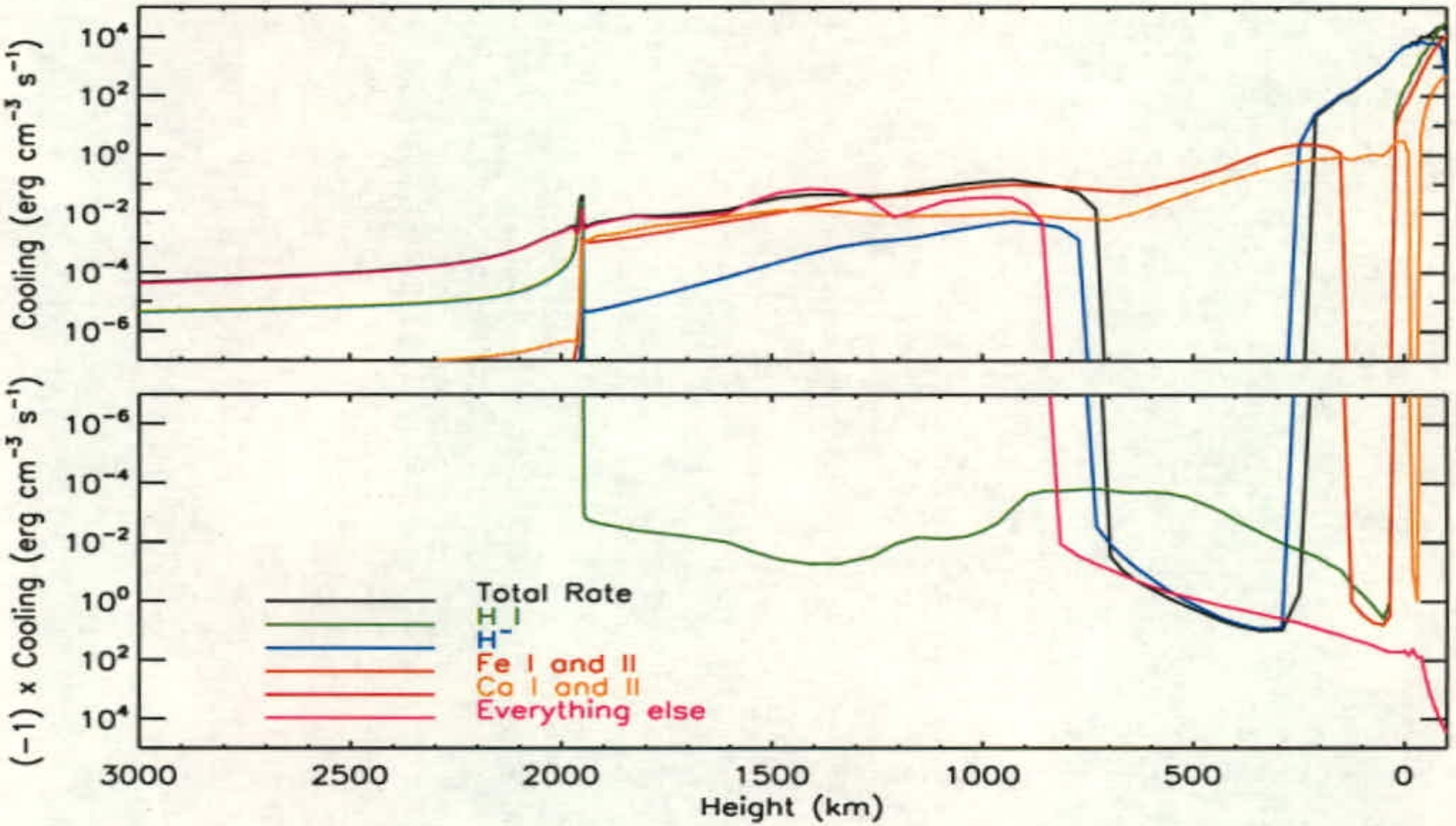


Fig. 6.— Total calculated net radiative cooling rate for the quiet Sun, and the contributions from Hydrogen, H^-, calcium, iron, and everything else.

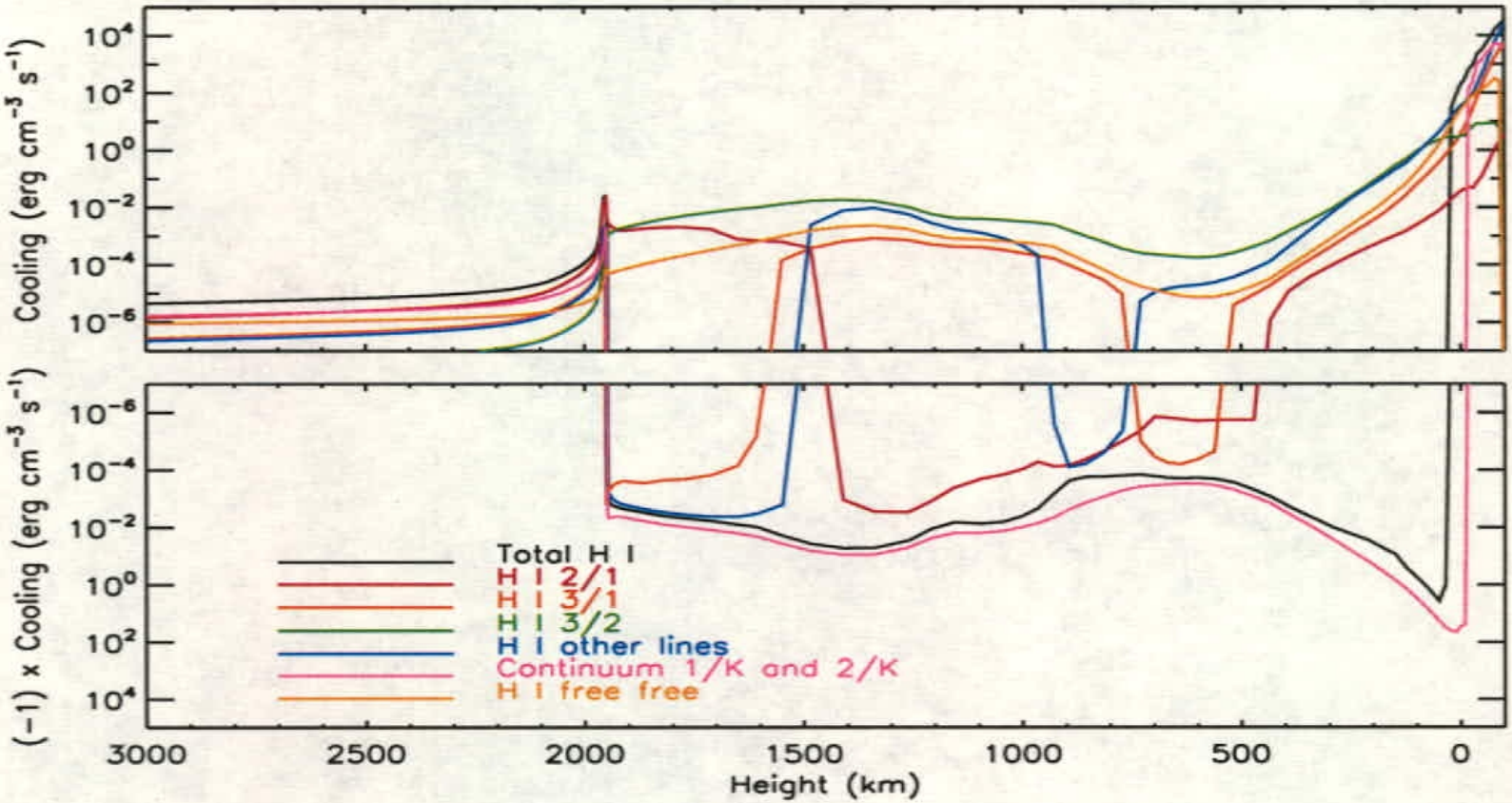


Fig. 7.— The components of the Hydrogen rate for the quiet Sun.

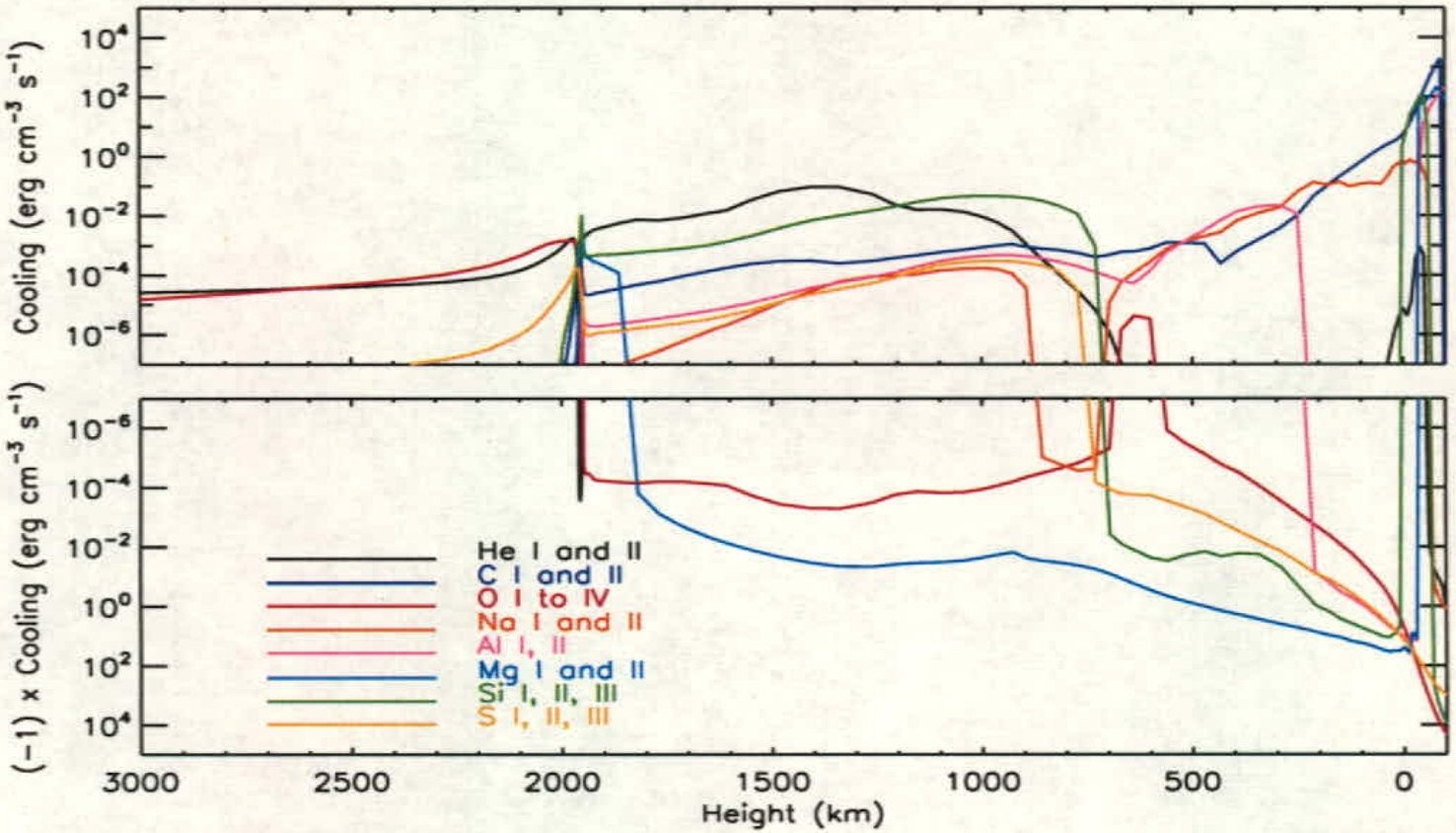


Fig. 8.— The other contributions for the quiet Sun: He I,II, C I,II, O I-IV, Na I,II, Mg I,II, Al I,II, Si I-III, and S I-III.

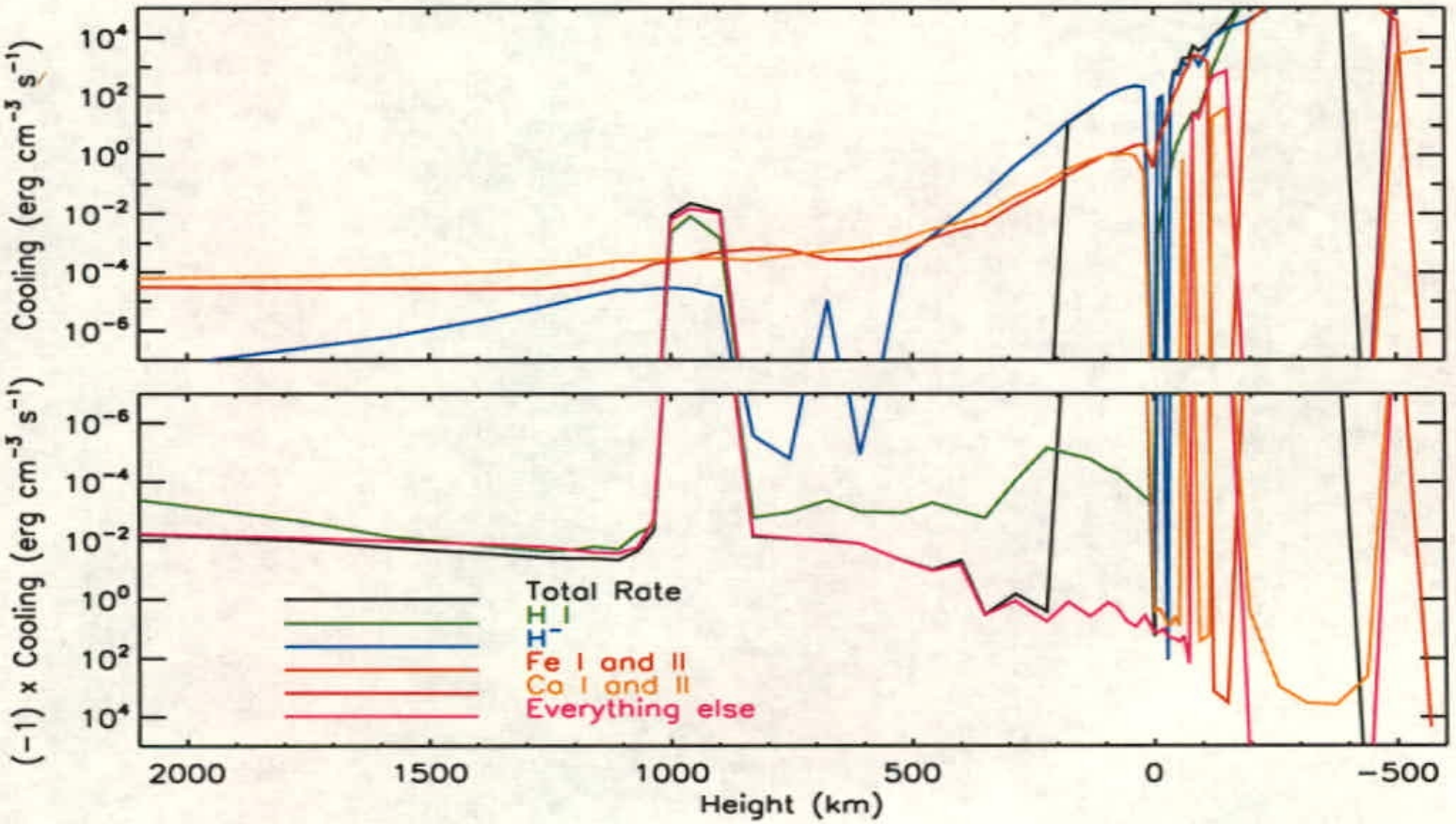


Fig. 9.— Total calculated net radiative cooling rate for the sunspot, and the contributions from Hydrogen, H^- , calcium, iron, and everything else.

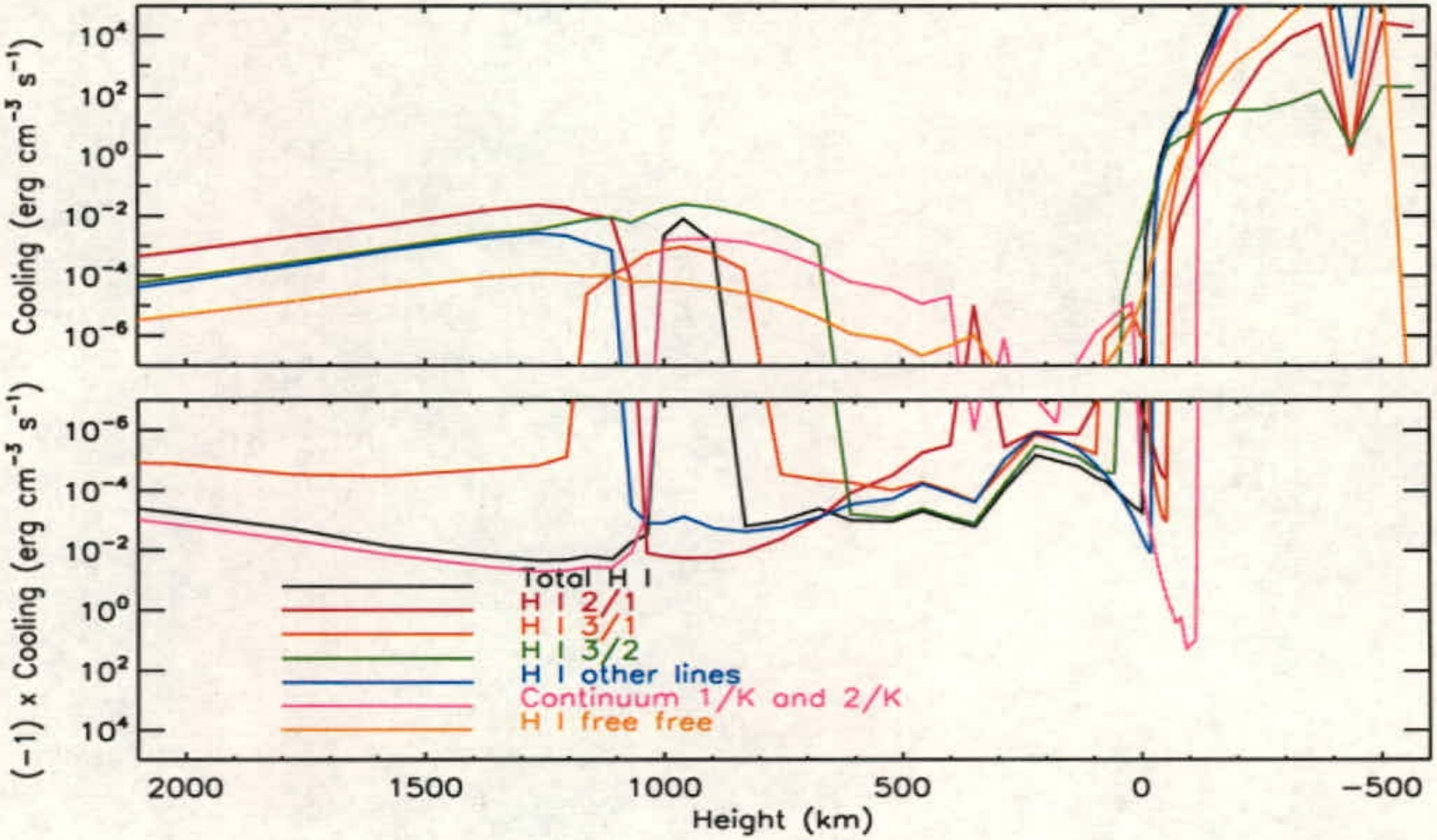


Fig. 10.— The components of the Hydrogen rate for the sunspot.

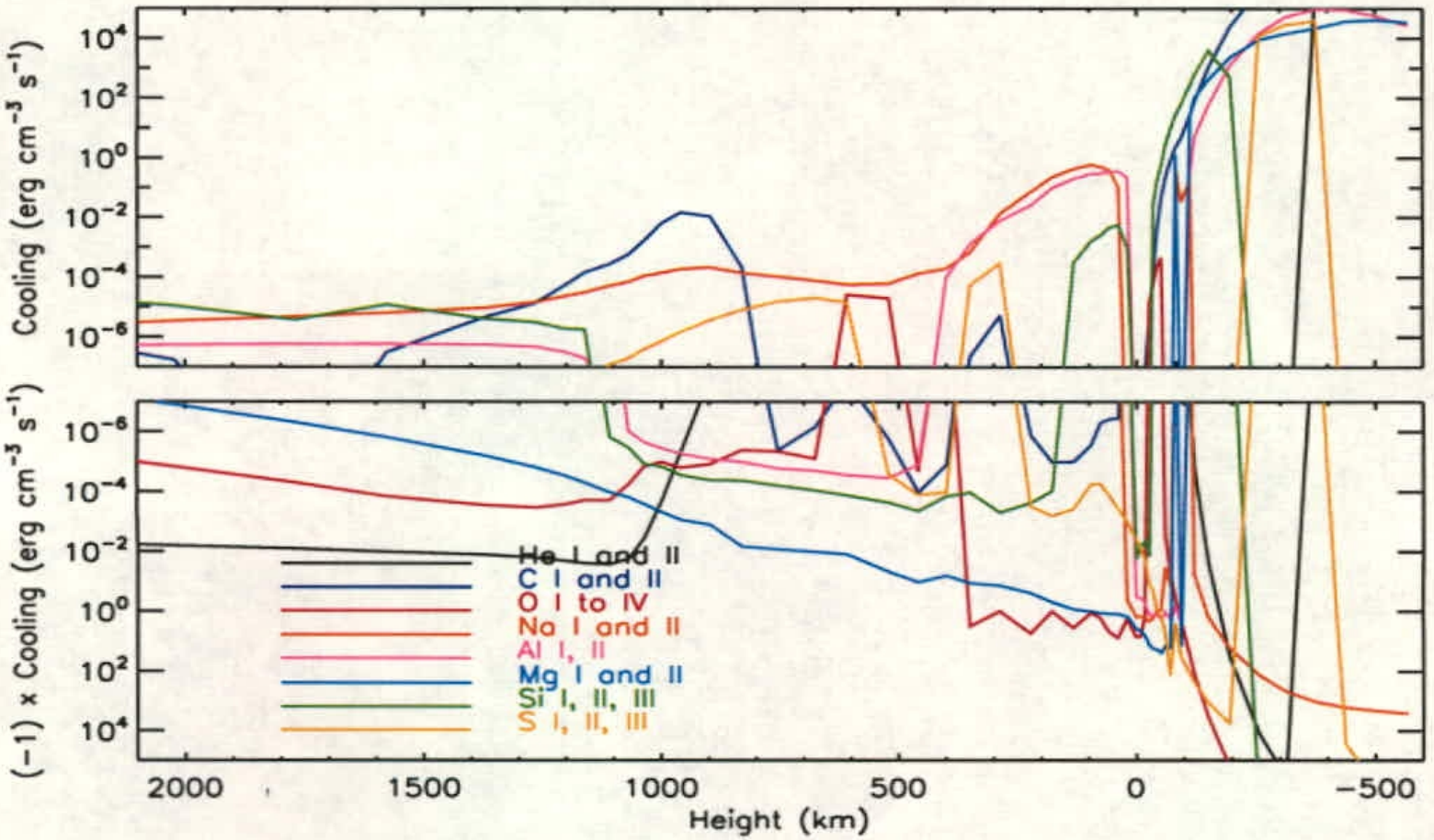


Fig. 11.— The other contributions for the sunspot: He I,II, C I,II, O I-IV, Na I,II, Mg I,II, Al I,II, Si I-III, and S I-III.