

## SOLAR PHYSICS PARAMETERS<sup>24</sup>

Parameter	Symbol	Value	Units
Total mass	$M_{\odot}$	$1.99 \times 10^{33}$	g
Radius	$R_{\odot}$	$6.96 \times 10^{10}$	cm
Surface gravity	$g_{\odot}$	$2.74 \times 10^4$	$\text{cm s}^{-2}$
Escape speed	$v_{\infty}$	$6.18 \times 10^7$	$\text{cm s}^{-1}$
Upward mass flux in spicules	—	$1.6 \times 10^{-9}$	$\text{g cm}^{-2} \text{ s}^{-1}$
Vertically integrated atmospheric density	—	4.28	$\text{g cm}^{-2}$
Sunspot magnetic field strength	$B_{\max}$	2500–3500	G
Surface effective temperature	$T_0$	5770	K
Radiant power	$\mathcal{L}_{\odot}$	$3.83 \times 10^{33}$	$\text{erg s}^{-1}$
Radiant flux density	$\mathcal{F}$	$6.28 \times 10^{10}$	$\text{erg cm}^{-2} \text{ s}^{-1}$
Optical depth at 500 nm, measured from photosphere	$\tau_5$	0.99	—
Astronomical unit (radius of earth's orbit)	AU	$1.50 \times 10^{13}$	cm
Solar constant (intensity at 1 AU)	$f$	$1.36 \times 10^6$	$\text{erg cm}^{-2} \text{ s}^{-1}$

## Chromosphere and Corona<sup>25</sup>

Parameter (Units)	Quiet Sun	Coronal Hole	Active Region
Chromospheric radiation losses ( $\text{erg cm}^{-2} \text{ s}^{-1}$ )			
Low chromosphere	$2 \times 10^6$	$2 \times 10^6$	$\gtrsim 10^7$
Middle chromosphere	$2 \times 10^6$	$2 \times 10^6$	$10^7$
Upper chromosphere	$3 \times 10^5$	$3 \times 10^5$	$2 \times 10^6$
Total	$4 \times 10^6$	$4 \times 10^6$	$\gtrsim 2 \times 10^7$
Transition layer pressure ( $\text{dyne cm}^{-2}$ )	0.2	0.07	2
Coronal temperature (K) at $1.1 R_{\odot}$	$1.1\text{--}1.6 \times 10^6$	$10^6$	$2.5 \times 10^6$
Coronal energy losses ( $\text{erg cm}^{-2} \text{ s}^{-1}$ )			
Conduction	$2 \times 10^5$	$6 \times 10^4$	$10^5\text{--}10^7$
Radiation	$10^5$	$10^4$	$5 \times 10^6$
Solar Wind	$\lesssim 5 \times 10^4$	$7 \times 10^5$	$< 10^5$
Total	$3 \times 10^5$	$8 \times 10^5$	$10^7$
Solar wind mass loss ( $\text{g cm}^{-2} \text{ s}^{-1}$ )	$\lesssim 2 \times 10^{-11}$	$2 \times 10^{-10}$	$< 4 \times 10^{-11}$