

Appendix:

Astrophysical Quantities

Earth Quantities

Earth's age: $T = (4.55 \pm 0.05) \times 10^9$ years

Earth equatorial rotational velocity: $*V_{\oplus} = 0.46510$ km/s

Earth's mass: $*M_{\oplus} = 5.976 \times 10^{24}$ kg

Earth's moment of inertia:

about rotations axis: $C = 0.3306 M_{\oplus} a^2 = 8.04 \times 10^{44}$ g·cm²

about equatorial axis: $A = 0.3295 M_{\oplus} a^2$

Earth's radius:

equatorial radius: $a = 6,378.164 \pm 0.003$ km

polar radius: $c = 6,356.779$ km

mean radius: $R_{\oplus} = 6,371.03$ km

Earth surface standard gravity:

$g_0 = 9.80665$ m/s²

at equator $\frac{g}{\text{centrifugal acceleration}} = 288.38$

Continental movement rate: $r \approx 2$ cm/year

Duration of each glaciation: $\sim 50,000$ year

End of recent glaciations: 11,000 year ago

Land area: $A = 1.49 \times 10^{18} \text{ cm}^2$

Ocean area: $A_{\text{O}} = 3.61 \times 10^{18} \text{ cm}^2$

Period of geological ice age: 250×10^6 years

Period of glaciations and inter-glaciations: $P = 250,000$ years

Horizontal magnetic field H at geomagnetic equator: $B = 0.31$ gauss (0.29 – 0.40)

Vertical magnetic field Z at geomagnetic N pole: $B = 0.58$ gauss

Vertical magnetic field Z at geomagnetic S pole: $B = 0.68$ gauss

Sun Quantities

Sun's age: 5×10^9 years

Sun's mass: $M_{\odot} = 1.989 \times 10^{30} \text{ kg}$

Sun's moment of inertia: $I = 5.7 \times 10^{53} \text{ g}\cdot\text{cm}^3$

Sun's oblateness: $0''.05$

Sun's radius: $R_{\odot} = 6.9599 \times 10^8 \text{ m}$

Sun's rotational energy: $E = 2.4 \times 10^{42} \text{ erg}$

Sun's surface area: $A_{\odot} = 6.87 \times 10^{22} \text{ cm}^2$

Sun's surface gravity: $a_{\odot} = 2.7398 \times 10^2 \text{ m/s}^2$

Sun's volume: $V_{\odot} = 1.4122 \times 10^{33} \text{ cm}^3$

Radial variation of the sun's temperature:

$\frac{r_{\odot}}{R_{\odot}}$	1.0	1.2	1.5	2	3	5	10	20
$T(10^6 \text{ K})$	0.5	1.5	1.7	1.8	1.7	1.4	1.1	0.8

Equatorial surface velocity (sunspot): $V = 2.03$ km/s

Equatorial surface velocity (reversing layer): $V = 1.93$ km/s

Number of granules on whole photospheres surface: $N = 4 \times 10^6$

Life-time of granules: $T = 8$ min

Other Physical Quantities

Oxygen: O 8 15.9994

Magnesium: Mg 12 24.304

Silicon: Si 14 28.086

Iron: Fe 26 55.847

Nickel: Ni 28 58.71

Uranium: U 92 238.029

Astronomical unit: $1 \text{ AU} = 1.495979 \times 10^{13}$ cm

Avogadro number: $N = 6.022141179 \times 10^{26}$

Light speed: $c = 2.99792458 \times 10^8$ m/s

Molecular weight of air: $M_w = 28.970$

Wien's constant: $C_w = 2.897769 \times 10^{-3}$ m·K

Stefan-Boltzmann constant: $\sigma = 5.670373 \times 10^{-8}$ W·m⁻²·K⁻⁴

Elementary electric charge: $e = 1.602189 \times 10^{-19}$ C

Newton's constant: $G = 6.67384(80) \times 10^{-11} \text{ m}^3 \cdot \text{kg}^{-1} \cdot \text{s}^{-2}$

Electric constant: $\epsilon_0 = 8.8541878 \times 10^{-12}$ F/m

Electron rest mass: $M_e = 9.109534 \times 10^{-31}$ kg

Proton rest mass: $M_p = 1.672648 \times 10^{-27}$ kg

Planck's constant: $h = 6.626176 \times 10^{-34}$ Js

1° of latitude = $111.1334 - 0.5594 \cos 2\phi + 0.0012 \cos 4\phi$ km

1° of longitude = $111.4133 \cos \phi - 0.0935 \cos 3\phi + 0.0001 \cos 5\phi$ km

Sidereal year: 1 year = 3.1558149984×10^7 s

1 parsec = 3.0856×10^{16} m = 3.2615 light years

References:

Allen, C. W. 1973. *Astrophysical Quantities*, Third Edition. University of London, The Athlone Press.

Hammer, Karl, Hans Morass, and Erich Raab. 1977. *Lehrbuch Der Physik* by. Verlag Oldenbourg, Wien.