

# Fundamental Physical Constants -- Complete Listing 2010

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| quantity   | value                  | uncertainty          | power             | unit                              |
|--|------------------------|----------------------|-------------------|-----------------------------------|
| molar mass constant  | 1                      | (exact)              | 10 <sup>-3</sup>  | kg mol <sup>-1</sup>              |
| standard-state pressure                                    | 1                      | (exact)              | 10 <sup>5</sup>   | Pa                                |
| Angstrom star  | 1,000 014 95           | 0,000 000 90         | 10 <sup>-10</sup> | m                                 |
| electron mag. mom. to Bohr magneton ratio $\frac{1}{2}g_e$ | – 1,001 159 652 180 81 | 0,000 000 000 000 18 |                   |                                   |
| neutron-proton mass ratio                                  | 1,001 378 419 17       | 0,000 000 000 45     |                   |                                   |
| Cu x unit  | 1,002 076 97           | 0,000 000 28         | 10 <sup>-13</sup> | m                                 |
| Mo x unit  | 1,002 099 52           | 0,000 000 53         | 10 <sup>-13</sup> | m                                 |
| proton mass in u   | 1,007 276 466 812      | 0,000 000 000 090    |                   | u                                 |
| proton molar mass  | 1,007 276 466 812      | 0,000 000 000 090    | 10 <sup>-3</sup>  | kg mol <sup>-1</sup>              |
| neutron mass in u  | 1,008 664 916 00       | 0,000 000 000 43     |                   | u                                 |
| neutron molar mass   | 1,008 664 916 00       | 0,000 000 000 43     | 10 <sup>-3</sup>  | kg mol <sup>-1</sup>              |
| standard atmosphere  | 1,013 25               | (exact)              | 10 <sup>5</sup>   | Pa                                |
| neutron-electron mag. mom. ratio                           | 1,040 668 82           | 0,000 000 25         | 10 <sup>-3</sup>  |                                   |
| neutron mag. mom. to Bohr magneton ratio                   | – 1,041 875 63         | 0,000 000 25         | 10 <sup>-3</sup>  |                                   |
| atomic unit of action $\hbar$                              | 1,054 571 726          | 0,000 000 047        | 10 <sup>-34</sup> | J s                               |
| natural unit of action $\hbar$                             | 1,054 571 726          | 0,000 000 047        | 10 <sup>-34</sup> | J s                               |
| Planck constant over $2\pi$ $\hbar$                        | 1,054 571 726          | 0,000 000 047        | 10 <sup>-34</sup> | J s                               |
| muon mass energy equivalent in MeV                         | 1,056 583 715          | 0,000 000 035        | 10 <sup>2</sup>   | MeV                               |
| triton-proton mag. mom. ratio                              | 1,066 639 908          | 0,000 000 010        |                   |                                   |
| electron volt-atomic mass unit relationship                | 1,073 544 151          | 0,000 000 024        | 10 <sup>-9</sup>  | u                                 |
| shielded helion mag. mom.                                  | – 1,074 553 044        | 0,000 000 027        | 10 <sup>-26</sup> | J T <sup>-1</sup>                 |
| helion mag. mom.   | – 1,074 617 486        | 0,000 000 027        | 10 <sup>-26</sup> | J T <sup>-1</sup>                 |
| atomic mass unit-kelvin relationship                       | 1,080 954 08           | 0,000 000 98         | 10 <sup>13</sup>  | K                                 |
| atomic unit of charge density                              | 1,081 202 338          | 0,000 000 024        | 10 <sup>12</sup>  | C m <sup>-3</sup>                 |
| Rydberg constant $R_\infty$                                | 1,097 373 156 8539     | 0,000 000 000 0055   | 10 <sup>7</sup>   | m <sup>-1</sup>                   |
| tau Compton wavelength over $2\pi$                         | 1,110 56               | 0,000 10             | 10 <sup>-16</sup> | m                                 |
| atomic unit of permittivity                                | 1,112 650 056...       | (exact)              | 10 <sup>-10</sup> | F m <sup>-1</sup>                 |
| joule-kilogram relationship                                | 1,112 650 056...       | (exact)              | 10 <sup>-17</sup> | kg                                |
| muon-neutron mass ratio                                    | 1,124 545 177          | 0,000 000 028        | 10 <sup>-1</sup>  |                                   |
| muon-proton mass ratio                                     | 1,126 095 272          | 0,000 000 028        | 10 <sup>-1</sup>  |                                   |
| muon mass in u   | 1,134 289 267          | 0,000 000 029        | 10 <sup>-1</sup>  | u                                 |
| muon molar mass  | 1,134 289 267          | 0,000 000 029        | 10 <sup>-4</sup>  | kg mol <sup>-1</sup>              |
| Sackur-Tetrode constant (1 K, 100 kPa)                     | – 1,151 7078           | 0,000 0023           |                   |                                   |
| shielded helion mag. mom. to Bohr magneton ratio           | – 1,158 671 471        | 0,000 000 014        | 10 <sup>-3</sup>  |                                   |
| helion mag. mom. to Bohr magneton ratio                    | – 1,158 740 958        | 0,000 000 014        | 10 <sup>-3</sup>  |                                   |
| electron mag. mom. anomaly $a_e$                           | 1,159 652 180 81       | 0,000 000 000 18     | 10 <sup>-3</sup>  |                                   |
| electron volt-kelvin relationship                          | 1,160 4519             | 0,000 0011           | 10 <sup>4</sup>   | K                                 |
| Sackur-Tetrode constant (1 K, 101.325 kPa)                 | – 1,164 8708           | 0,000 0023           |                   |                                   |
| muon mag. mom. anomaly                                     | 1,165 920 91           | 0,000 000 63         | 10 <sup>-3</sup>  |                                   |
| Fermi coupling constant                                    | 1,166 364              | 0,000 005            | 10 <sup>-5</sup>  | GeV <sup>-2</sup>                 |
| muon Compton wavelength                                    | 1,173 444 103          | 0,000 000 030        | 10 <sup>-14</sup> | m                                 |
| first radiation constant for spectral radiance $c_{11}$    | 1,191 042 869          | 0,000 000 053        | 10 <sup>-16</sup> | W m <sup>2</sup> sr <sup>-1</sup> |
| molar Planck constant times $c_0$                          | 1,196 265 6580         | 0,000 000 0012       | 10 <sup>-1</sup>  | J m mol <sup>-1</sup>             |
| molar mass of carbon-12                                    | 1,2                    | (exact)              | 10 <sup>-2</sup>  | kg mol <sup>-1</sup>              |
| molar volume of silicon                                    | 1,205 883 301          | 0,000 000 080        | 10 <sup>-5</sup>  | m <sup>3</sup> mol <sup>-1</sup>  |
| Planck mass energy equivalent in GeV $W_{Pl}$              | 1,220 932              | 0,000 073            | 10 <sup>19</sup>  | GeV                               |
| inverse meter-electron volt relationship                   | 1,239 841 930          | 0,000 000 027        | 10 <sup>-6</sup>  | eV                                |
| mag. constant $\mu_0$                                      | 1,256 637 0614...      | (exact)              | 10 <sup>-6</sup>  | N A <sup>-2</sup>                 |
| natural unit of time $1/\omega_e$                          | 1,288 088 668 33       | 0,000 000 000 83     | 10 <sup>-21</sup> | s                                 |
| inverse of conductance quantum $1/G_0$                     | 1,290 640 372 17       | 0,000 000 000 42     | 10 <sup>4</sup>   | $\Omega$                          |
| neutron-proton mass difference energy eq. in MeV           | 1,293 332 17           | 0,000 000 42         |                   |                                   |
| neutron Compton wavelength                                 | 1,319 590 9071         | 0,000 000 0014       | 10 <sup>-15</sup> | m                                 |
| proton Compton wavelength                                  | 1,321 409 8565         | 0,000 000 0013       | 10 <sup>-15</sup> | m                                 |
| inverse meter-atomic mass unit relationship                | 1,331 025 0515         | 0,000 000 0013       | 10 <sup>-15</sup> | u                                 |
| kilogram-hertz relationship                                | 1,356 392 608          | 0,000 000 060        | 10 <sup>50</sup>  | Hz                                |
| Rydberg constant times $hc_0$ in eV $R_{hc} = R_y$         | 1,360 569 253          | 0,000 000 030        | 10 <sup>1</sup>   | eV                                |
| inverse fine-structure constant $1/\alpha$                 | 1,370 359 990 74       | 0,000 000 000 44     | 10 <sup>2</sup>   |                                   |
| electron to alpha particle mass ratio                      | 1,370 933 5561         | 0,000 000 0010       | 10 <sup>-4</sup>  |                                   |
| Boltzmann constant $k_B$                                   | 1,380 6488             | 0,000 0013           | 10 <sup>-23</sup> | J K <sup>-1</sup>                 |
| kelvin-joule relationship                                  | 1,380 6488             | 0,000 0013           | 10 <sup>-23</sup> | J                                 |
| neutron-proton mass difference in u                        | 1,388 449 19           | 0,000 000 45         | 10 <sup>-3</sup>  |                                   |
| Bohr magneton in Hz/T                                      | 1,399 624 555          | 0,000 000 031        | 10 <sup>10</sup>  | Hz T <sup>-1</sup>                |
| shielded proton mag. mom.                                  | 1,410 570 499          | 0,000 000 035        | 10 <sup>-26</sup> | J T <sup>-1</sup>                 |
| proton mag. mom.   | 1,410 606 743          | 0,000 000 033        | 10 <sup>-26</sup> | J T <sup>-1</sup>                 |
| Planck temperature $T_{Pl}$                                | 1,416 833              | 0,000 085            | 10 <sup>32</sup>  | K                                 |

|   |     |                      |                               |                   |   |
|---|-----|----------------------|-------------------------------|-------------------|---|
| inverse meter-kelvin relationship                   |     | 1,438 7770           | 0,000 0013                    | 10 <sup>-2</sup>  | K   |
| second radiation constant                           |     | 1,438 7770           | 0,000 0013                    | 10 <sup>-2</sup>  | m K   |
| proton-neutron mag. mom. ratio                      | -   | 1,459 898 06         | 0,000 000 34                  |                   |   |
| atomic mass constant energy equivalent              |     | 1,492 417 954        | 0,000 000 066                 | 10 <sup>-10</sup> | J   |
| atomic mass unit-joule relationship                 |     | 1,492 417 954        | 0,000 000 066                 | 10 <sup>-10</sup> | J   |
| proton mass energy equivalent                       |     | 1,503 277 484        | 0,000 000 066                 | 10 <sup>-10</sup> | J   |
| triton mag. mom.                                    |     | 1,504 609 447        | 0,000 000 038                 | 10 <sup>-26</sup> | J T <sup>-1</sup>                             |
| neutron mass energy equivalent $m_n c^2$            |     | 1,505 349 630        | 0,000 000 066                 | 10 <sup>-10</sup> | J   |
| joule-hertz relationship                            |     | 1,509 190 311        | 0,000 000 067                 | 10 <sup>33</sup>  | Hz  |
| hertz-hartree relationship                          |     | 1,519 829 846 0045   | 0,000 000 000 0076            | 10 <sup>-16</sup> | E_h   |
| shielded proton mag. mom. to Bohr magneton ratio    |     | 1,520 993 128        | 0,000 000 017                 | 10 <sup>-3</sup>  |   |
| proton mag. mom. to Bohr magneton ratio             |     | 1,521 032 210        | 0,000 000 012                 | 10 <sup>-3</sup>  |   |
| kelvin-kilogram relationship                        |     | 1,536 1790           | 0,000 0014                    | 10 <sup>-40</sup> | kg  |
| triton-neutron mag. mom. ratio                      | -   | 1,557 185 53         | 0,000 000 37                  |                   |   |
| atomic unit of charge $e_0$                         |     | 1,602 176 565        | 0,000 000 035                 | 10 <sup>-19</sup> | C   |
| electron volt                                       |     | 1,602 176 565        | 0,000 000 035                 | 10 <sup>-19</sup> | J   |
| electron volt-joule relationship                    |     | 1,602 176 565        | 0,000 000 035                 | 10 <sup>-19</sup> | J   |
| elementary charge $e_0$                             |     | 1,602 176 565        | 0,000 000 035                 | 10 <sup>-19</sup> | C   |
| Planck length $l_p$                                 |     | 1,616 199            | 0,000 097                     | 10 <sup>-35</sup> | m   |
| triton-electron mag. mom. ratio                     | -   | 1,620 514 423        | 0,000 000 021                 | 10 <sup>-3</sup>  |   |
| triton mag. mom. to Bohr magneton ratio             |     | 1,622 393 657        | 0,000 000 02110 <sup>-3</sup> |                   |   |
| atomic unit of electric polarizability              |     | 1,648 777 2754       | 0,000 000 0016                | 10 <sup>-41</sup> | C <sup>2</sup> m <sup>2</sup> J <sup>-1</sup> |
| atomic mass constant                                |     | 1,660 538 920        | 0,000 000 073                 | 10 <sup>-27</sup> | kg  |
| atomic mass unit-kilogram relationship              |     | 1,660 538 920        | 0,000 000 073                 | 10 <sup>-27</sup> | kg  |
| unified atomic mass unit $u$                        |     | 1,660 538 920        | 0,000 000 073                 | 10 <sup>-27</sup> | kg  |
| proton mass $m_p$                                   |     | 1,672 621 777        | 0,000 000 074                 | 10 <sup>-27</sup> | kg  |
| neutron mass $m_n$                                  |     | 1,674 927 351        | 0,000 000 074                 | 10 <sup>-27</sup> | kg  |
| tau-muon mass ratio                                 |     | 1,681 67             | 0,000 15                      | 10 <sup>1</sup>   |   |
| muon mass energy equivalent                         |     | 1,692 833 667        | 0,000 000 086                 | 10 <sup>-11</sup> | J   |
| electron charge to mass quotient $e_0/m_{e0}$       | -   | 1,758 820 088        | 0,000 000 039                 | 10 <sup>-11</sup> | C kg <sup>-1</sup>                            |
| electron gyromag. ratio $\gamma_e$                  |     | 1,760 859 708        | 0,000 000 039                 | 10 <sup>11</sup>  | s <sup>-1</sup> T <sup>-1</sup>               |
| tau mass energy equivalent in MeV                   |     | 1,776 82             | 0,000 16                      | 10 <sup>3</sup>   | MeV   |
| electron volt-kilogram relationship                 |     | 1,782 661 845        | 0,000 000 039                 | 10 <sup>-36</sup> | kg  |
| electron-triton mass ratio                          |     | 1,819 200 0656       | 0,000 000 0020                | 10 <sup>-4</sup>  |   |
| electron-helion mass ratio                          |     | 1,819 543 0765       | 0,000 000 0020                | 10 <sup>-4</sup>  |   |
| neutron gyromag. ratio                              |     | 1,832 471 79         | 0,000 000 43                  | 10 <sup>8</sup>   | s <sup>-1</sup> T <sup>-1</sup>               |
| proton-electron mass ratio                          |     | 1,836 152 6721       | 0,000 000 0014                | 10 <sup>3</sup>   |   |
| electron mag. mom. to nuclear magneton ratio        | -   | 1,838 281 9705       | 0,000 000 0014                | 10 <sup>3</sup>   |   |
| neutron-electron mass ratio                         |     | 1,838 683 6601       | 0,000 000 0016                | 10 <sup>3</sup>   |   |
| atomic unit of mag. dipole mom.                     |     | 1,854 801 936        | 0,000 000 041                 | 10 <sup>-23</sup> | J T <sup>-1</sup>                             |
| muon Compton wavelength over $2\pi$                 |     | 1,867 594 294        | 0,000 000 047                 | 10 <sup>-15</sup> | m   |
| deuteron mass energy equivalent in MeV              |     | 1,875 612 858        | 0,000 000 041                 | 10 <sup>3</sup>   | MeV   |
| muon mass   |     | 1,883 531 475        | 0,000 000 096                 | 10 <sup>-28</sup> | kg  |
| tau-neutron mass ratio                              |     | 1,891 11             | 0,000 17                      |                   |   |
| tau-proton mass ratio                               |     | 1,893 72             | 0,000 17                      |                   |   |
| tau mass in u                                       |     | 1,907 49             | 0,000 17                      |                   | u   |
| tau molar mass                                      |     | 1,907 49             | 0,000 17                      | 10 <sup>-3</sup>  | kg mol <sup>-1</sup>                          |
| neutron mag. mom. to nuclear magneton ratio         | -   | 1,913 042 72         | 0,000 000 45                  |                   |   |
| {220} lattice spacing of silicon                    |     | 1,920 155 714        | 0,000 000 032                 | 10 <sup>-10</sup> | m   |
| Planck constant over $2\pi$ times $c_0$ in MeV fm   |     | 1,973 269 718        | 0,000 000 044                 | 10 <sup>2</sup>   | MeV fm  |
| inverse meter-joule relationship                    |     | 1,986 445 684        | 0,000 000 088                 | 10 <sup>-25</sup> | J   |
| atomic unit of mom.um                               |     | 1,992 851 740        | 0,000 000 088                 | 10 <sup>-24</sup> | kg m s <sup>-1</sup>                          |
| deuteron-proton mass ratio                          |     | 1,999 007 500 97     | 0,000 000 000 18              |                   |   |
| electron g factor $g_e$                             | -   | 2,002 319 304 361 63 | 0,000 000 000 000 36          |                   |   |
| muon g factor                                       | -   | 2,002 331 8418       | 0,000 000 0013                |                   |   |
| deuteron mass in u                                  |     | 2,013 553 212 712    | 0,000 000 000 077             |                   | u   |
| deuteron molar mass                                 |     | 2,013 553 212 712    | 0,000 000 000 077             | 10 <sup>-3</sup>  | kg mol <sup>-1</sup>                          |
| shielded helion gyromag. ratio                      |     | 2,037 894 659        | 0,000 000 051                 | 10 <sup>8</sup>   | s <sup>-1</sup> T <sup>-1</sup>               |
| kilogram-hartree relationship                       |     | 2,061 485 968        | 0,000 000 091                 | 10 <sup>34</sup>  | E_h   |
| electron-muon mag. mom. ratio                       |     | 2,067 669 896        | 0,000 000 052                 | 10 <sup>2</sup>   |   |
| muon-electron mass ratio                            |     | 2,067 682 843        | 0,000 000 052                 | 10 <sup>2</sup>   |   |
| mag. flux quantum $\Phi_0$                          | (-) | 2,067 833 758        | 0,000 000 046                 | 10 <sup>-15</sup> | Wb  |
| neutron-proton mass difference energy equivalent    |     | 2,072 146 50         | 0,000 000 68                  | 10 <sup>-13</sup> |   |
| Boltzmann constant in Hz/K                          |     | 2,083 6618           | 0,000 0019                    | 10 <sup>10</sup>  | Hz K <sup>-1</sup>                            |
| kelvin-hertz relationship                           |     | 2,083 6618           | 0,000 0019                    | 10 <sup>10</sup>  | Hz  |
| neutron Compton wavelength over $2\pi$              |     | 2,100 194 1572       | 0,000 000 0023                | 10 <sup>-16</sup> | m   |
| proton Compton wavelength over $2\pi$               |     | 2,103 089 1051       | 0,000 000 0021                | 10 <sup>-16</sup> | m   |
| shielded helion mag. mom. to nuclear magneton ratio | -   | 2,127 497 718        | 0,000 000 025                 |                   |   |
| helion mag. mom. to nuclear magneton ratio          | -   | 2,127 625 306        | 0,000 000 025                 |                   |   |
| deuteron rms charge radius                          |     | 2,1424               | 0,0021                        | 10 <sup>-15</sup> | m   |

|  |   |                   |                   |                   |  |
|--|---|-------------------|-------------------|-------------------|--|
| electron-deuteron mag. mom. ratio                        | – | 2,143 923 498     | 0,000 000 018     | 10 <sup>-7</sup>  |  |
| Planck mass $m_{\text{Pl}}$                              |   | 2,176 51          | 0,000 13          | 10 <sup>-8</sup>  | kg   |
| Rydberg constant times $hc_0$ in J $R_{\text{hc}} = R_y$ |   | 2,179 872 171     | 0,000 000 096     | 10 <sup>-18</sup> | J  |
| atomic unit of velocity                                  |   | 2,187 691 263 79  | 0,000 000 000 71  | 10 <sup>6</sup>   | m s <sup>-1</sup>                            |
| hartree-inverse meter relationship                       |   | 2,194 746 313 708 | 0,000 000 000 011 | 10 <sup>7</sup>   | m <sup>-1</sup>                              |
| inverse meter-kilogram relationship $\rho$               |   | 2,210 218 902     | 0,000 000 098     | 10 <sup>-42</sup> | kg   |
| weak mixing angle  |   | 2,223             | 0,021             | 10 <sup>-1</sup>  |  |
| molar volume of ideal gas (273.15 K, 101.325 kPa)        |   | 2,241 3968        | 0,000 0020        | 10 <sup>-2</sup>  | m <sup>3</sup> mol <sup>-1</sup>             |
| atomic mass unit-hertz relationship                      |   | 2,252 342 7164    | 0,000 000 0023    | 10 <sup>23</sup>  | Hz   |
| molar volume of ideal gas (273.15 K, 100 kPa)            |   | 2,271 0953        | 0,000 0021        | 10 <sup>-2</sup>  | m <sup>3</sup> mol <sup>-1</sup>             |
| joule-hartree relationship                               |   | 2,293 712 48      | 0,000 000 10      | 10 <sup>17</sup>  | E_h  |
| neutron-proton mass difference                           |   | 2,305 573 92      | 0,000 000 76      | 10 <sup>-30</sup> |  |
| atomic unit of mag. flux density                         |   | 2,350 517 464     | 0,000 000 052     | 10 <sup>5</sup>   | T  |
| electron volt-hertz relationship                         |   | 2,417 989 348     | 0,000 000 053     | 10 <sup>14</sup>  | Hz   |
| elementary charge over $h$ $e_0/h$                       |   | 2,417 989 348     | 0,000 000 053     | 10 <sup>14</sup>  | A J <sup>-1</sup>                            |
| atomic unit of time                                      |   | 2,418 884 326 502 | 0,000 000 000 012 | 10 <sup>-17</sup> | s  |
| Compton wavelength $\lambda_{\text{ce}}$                 |   | 2,426 310 2389    | 0,000 000 0016    | 10 <sup>-12</sup> | m  |
| nuclear magneton in inverse meters per tesla             |   | 2,542 623 527     | 0,000 000 056     | 10 <sup>-2</sup>  | m <sup>-1</sup> T <sup>-1</sup>              |
| proton mag. shielding correction                         |   | 2,5694            | 0,0014            | 10 <sup>-5</sup>  |  |
| von Klitzing constant $R_K$                              |   | 2,581 280 744 34  | 0,000 000 000 84  | 10 <sup>4</sup>   | $\Omega$                                     |
| conventional value of von Klitzing constant $R_K$        |   | 2,581 2807        | (exact)           | 10 <sup>4</sup>   | $\Omega$                                     |
| Loschmidt constant (273.15 K, 100 kPa)                   |   | 2,651 6462        | 0,000 0024        | 10 <sup>25</sup>  | m <sup>-3</sup>                              |
| shielded proton gyromag. ratio                           |   | 2,675 153 268     | 0,000 000 066     | 10 <sup>8</sup>   | s <sup>-1</sup> T <sup>-1</sup>              |
| proton gyromag. ratio                                    |   | 2,675 222 005     | 0,000 000 063     | 10 <sup>8</sup>   | s <sup>-1</sup> T <sup>-1</sup>              |
| Loschmidt constant (273.15 K, 101.325 kPa) $N_L$         |   | 2,686 7805        | 0,000 0024        | 10 <sup>25</sup>  | m <sup>-3</sup>                              |
| atomic unit of electric potential                        |   | 2,721 138 505     | 0,000 000 060     | 10 <sup>1</sup>   | V  |
| hartree-electron volt relationship                       |   | 2,721 138 505     | 0,000 000 060     | 10 <sup>1</sup>   | eV   |
| Hartree energy in eV                                     |   | 2,721 138 505     | 0,000 000 060     | 10 <sup>1</sup>   | eV   |
| electron-deuteron mass ratio                             |   | 2,724 437 1100    | 0,000 000 0021    | 10 <sup>-4</sup>  |  |
| natural unit of mom.um $p_e$                             |   | 2,730 924 29      | 0,000 000 12      | 10 <sup>-22</sup> | kg m s <sup>-1</sup>                         |
| shielded proton mag. mom. to nuclear magneton ratio      |   | 2,792 775 597     | 0,000 000 030     |                   |  |
| proton mag. mom. to nuclear magneton ratio               |   | 2,792 847 356     | 0,000 000 023     |                   |  |
| electron gyromag. ratio over $2\pi$ $\gamma_e/2\pi$      |   | 2,802 495 266     | 0,000 000 062     | 10 <sup>4</sup>   | MHz T <sup>-1</sup>                          |
| helion mass energy equivalent in MeV                     |   | 2,808 391 481     | 0,000 000 062     | 10 <sup>3</sup>   | MeV  |
| triton mass energy equivalent in MeV                     |   | 2,808 921 004     | 0,000 000 062     | 10 <sup>3</sup>   | MeV  |
| classical electron radius $r_e$                          |   | 2,817 940 3267    | 0,000 000 0027    | 10 <sup>-15</sup> | m  |
| tau mass energy equivalent                               |   | 2,846 78          | 0,000 26          | 10 <sup>-10</sup> | J  |
| electron-tau mass ratio                                  |   | 2,875 92          | 0,000 26          | 10 <sup>-4</sup>  |  |
| Wien wavelength displacement law constant                |   | 2,897 7721        | 0,000 0026        | 10 <sup>-3</sup>  | m K  |
| neutron gyromag. ratio over $2\pi$                       |   | 2,916 469 43      | 0,000 000 69      | 10 <sup>1</sup>   | MHz T <sup>-1</sup>                          |
| hartree-atomic mass unit relationship                    |   | 2,921 262 3252    | 0,000 000 0029    | 10 <sup>-8</sup>  | u  |
| triton mag. mom. to nuclear magneton ratio               |   | 2,978 962 448     | 0,000 000 038     |                   |  |
| helion-proton mass ratio                                 |   | 2,993 152 6707    | 0,000 000 0025    |                   |  |
| triton-proton mass ratio                                 |   | 2,993 717 0308    | 0,000 000 0025    |                   |  |
| inverse meter-hertz relationship                         |   | 2,997 924 58      | (exact)           | 10 <sup>8</sup>   | Hz   |
| natural unit of velocity $c_0$                           |   | 2,997 924 58      | (exact)           | 10 <sup>8</sup>   | m s <sup>-1</sup>                            |
| speed of light in vacuum $c_0$                           |   | 2,997 924 58      | (exact)           | 10 <sup>8</sup>   | m s <sup>-1</sup>                            |
| deuteron mass energy equivalent                          |   | 3,005 062 97      | 0,000 000 13      | 10 <sup>-10</sup> | J  |
| helion mass in u   |   | 3,014 932 2468    | 0,000 000 0025    |                   | u  |
| helion molar mass  |   | 3,014 932 2468    | 0,000 000 0025    | 10 <sup>-3</sup>  | kg mol <sup>-1</sup>                         |
| triton mass in u   |   | 3,015 500 7134    | 0,000 000 0025    |                   | u  |
| triton molar mass  |   | 3,015 500 7134    | 0,000 000 0025    | 10 <sup>-3</sup>  | kg mol <sup>-1</sup>                         |
| deuteron-proton mag. mom. ratio                          |   | 3,070 122 070     | 0,000 000 024     | 10 <sup>-1</sup>  |  |
| nuclear magneton in eV/T                                 |   | 3,152 451 2611    | 0,000 000 0032    | 10 <sup>-8</sup>  | eV T <sup>-1</sup>                           |
| hartree-kelvin relationship                              |   | 3,157 7504        | 0,000 0029        | 10 <sup>5</sup>   | K  |
| kelvin-hartree relationship                              |   | 3,166 8114        | 0,000 0029        | 10 <sup>-6</sup>  | E_h  |
| tau mass   |   | 3,167 47          | 0,000 29          | 10 <sup>-27</sup> | kg   |
| muon-proton mag. mom. ratio                              | – | 3,183 345 107     | 0,000 000 084     |                   |  |
| atomic unit of 1 <sup>st</sup> hyperpolarizability       |   | 3,206 361 449     | 0,000 000 071     | 10 <sup>-53</sup> | C <sup>3</sup> m <sup>3</sup> J <sup>2</sup> |
| shielded helion gyromag. ratio over $2\pi$               |   | 3,243 410 084     | 0,000 000 081     | 10 <sup>1</sup>   | MHz T <sup>-1</sup>                          |
| Rydberg constant times $c_0$ in Hz $R_{\infty c}$        |   | 3,289 841 960 364 | 0,000 000 000 017 | 10 <sup>15</sup>  | Hz   |
| hertz-inverse meter relationship                         |   | 3,335 640 951...  | (exact)           | 10 <sup>-9</sup>  | m <sup>-1</sup>                              |
| deuteron mass  |   | 3,343 583 48      | 0,000 000 15      | 10 <sup>-27</sup> | kg   |
| atomic mass unit-hartree relationship                    |   | 3,423 177 6838    | 0,000 000 0034    | 10 <sup>7</sup>   | E_h  |
| tau-electron mass ratio                                  |   | 3,477 15          | 0,000 31          | 10 <sup>3</sup>   |  |
| quantum of circulation $h/2m_{e0}$                       |   | 3,636 947 5520    | 0,000 000 0024    | 10 <sup>-4</sup>  | m <sup>2</sup> s <sup>-1</sup>               |
| nuclear magneton in K/T                                  |   | 3,658 2682        | 0,000 0033        | 10 <sup>-4</sup>  | K T <sup>-1</sup>                            |
| deuteron-electron mass ratio                             |   | 3,670 482 9644    | 0,000 000 0028    | 10 <sup>3</sup>   |  |
| electron volt-hartree relationship                       |   | 3,674 932 379     | 0,000 000 081     | 10 <sup>-2</sup>  | E_h  |

|  |                     |                   |                   |   |
|--|---------------------|-------------------|-------------------|---|
| alpha particle mass energy equivalent in MeV       | 3,727 379 239       | 0,000 000 082     | 10 <sup>3</sup>   | MeV   |
| first radiation constant                           | 3,741 771 53        | 0,000 000 17      | 10 <sup>-16</sup> | W m <sup>2</sup>                              |
| characteristic impedance of vacuum $Z_0$           | 3,767 303 134 61... | (exact)           | 10 <sup>2</sup>   | $\Omega$                                      |
| neutron g factor                                   | - 3,826 085 45      | 0,000 000 90      |                   |   |
| Compton wavelength over $2\pi$ $\lambda_{ce}$      | 3,861 592 6800      | 0,000 000 0025    | 10 <sup>-13</sup> | m   |
| natural unit of length $\lambda_{ce}=r_E$          | 3,861 592 6800      | 0,000 000 0025    | 10 <sup>-13</sup> | m   |
| alpha particle-proton mass ratio                   | 3,972 599 689 33    | 0,000 000 000 36  |                   |   |
| molar Planck constant                              | 3,990 312 7184      | 0,000 000 0040    | 10 <sup>-10</sup> | J s mol <sup>-1</sup>                         |
| alpha particle mass in u                           | 4,001 506 179 125   | 0,000 000 000 062 |                   | u   |
| alpha particle molar mass                          | 4,001 506 179 125   | 0,000 000 000 062 | 10 <sup>-3</sup>  | kg mol <sup>-1</sup>                          |
| hertz-electron volt relationship                   | 4,135 667 516       | 0,000 000 091     | 10 <sup>-15</sup> | eV  |
| Planck constant in eV s                            | 4,135 667 516       | 0,000 000 091     | 10 <sup>-15</sup> | eV s  |
| helion g factor                                    | - 4,255 250 612     | 0,000 000 050     |                   |   |
| shielded proton gyromag. ratio over $2\pi$         | 4,257 638 66        | 0,000 000 10      | 10 <sup>1</sup>   | MHz T <sup>-1</sup>                           |
| proton gyromag. ratio over $2\pi$                  | 4,257 748 06        | 0,000 000 10      | 10 <sup>1</sup>   | MHz T <sup>-1</sup>                           |
| deuteron mag. mom.                                 | 4,330 734 89        | 0,000 000 10      | 10 <sup>-27</sup> | J T <sup>-1</sup>                             |
| atomic unit of energy                              | 4,359 744 34        | 0,000 000 19      | 10 <sup>-18</sup> | J   |
| Hartree energy                                     | 4,359 744 34        | 0,000 000 19      | 10 <sup>-18</sup> | J   |
| hartree-joule relationship                         | 4,359 744 34        | 0,000 000 19      | 10 <sup>-18</sup> | J   |
| hertz-atomic mass unit relationship                | 4,439 821 6698      | 0,000 000 0044    | 10 <sup>-24</sup> | u   |
| deuteron-neutron mag. mom. ratio                   | - 4,482 0652        | 0,000 0011        | 10 <sup>-1</sup>  |   |
| atomic unit of electric quadrupole mom.            | 4,486 551 331       | 0,000 000 099     | 10 <sup>-40</sup> | C m <sup>2</sup>                              |
| muon mag. mom.                                     | - 4,490 448 07      | 0,000 000 15      | 10 <sup>-26</sup> | J T <sup>-1</sup>                             |
| helion mass energy equivalent                      | 4,499 539 02        | 0,000 000 20      | 10 <sup>-10</sup> | J   |
| triton mass energy equivalent                      | 4,500 387 41        | 0,000 000 20      | 10 <sup>-10</sup> | J   |
| kilogram-inverse meter relationship                | 4,524 438 73        | 0,000 000 20      | 10 <sup>41</sup>  | m <sup>-1</sup>                               |
| inverse meter-hartree relationship                 | 4,556 335 252 755   | 0,000 000 000 023 | 10 <sup>-8</sup>  | E_h   |
| deuteron-electron mag. mom. ratio                  | - 4,664 345 537     | 0,000 000 039     | 10 <sup>-4</sup>  |   |
| Bohr magneton in inverse meters per tesla          | 4,668 644 98        | 0,000 000 10      | 10 <sup>1</sup>   | m <sup>-1</sup> T <sup>-1</sup>               |
| deuteron mag. mom. to Bohr magneton ratio          | 4,669 754 556       | 0,000 000 039     | 10 <sup>-4</sup>  |   |
| hertz-kelvin relationship                          | 4,799 2434          | 0,000 0044        | 10 <sup>-11</sup> | K   |
| Josephson constant $K_J$                           | 4,835 978 70        | 0,000 000 11      | 10 <sup>14</sup>  | Hz V <sup>-1</sup>                            |
| conventional value of Josephson constant $K_J$     | 4,835 979           | (exact)           | 10 <sup>14</sup>  | Hz V <sup>-1</sup>                            |
| electron-muon mass ratio                           | 4,836 331 66        | 0,000 000 12      | 10 <sup>-3</sup>  |   |
| muon mag. mom. to Bohr magneton ratio              | - 4,841 970 44      | 0,000 000 12      | 10 <sup>-3</sup>  |   |
| hartree-kilogram relationship                      | 4,850 869 79        | 0,000 000 21      | 10 <sup>-35</sup> | kg  |
| helion mass  | 5,006 412 34        | 0,000 000 22      | 10 <sup>-27</sup> | kg  |
| triton mass  | 5,007 356 30        | 0,000 000 22      | 10 <sup>-27</sup> | kg  |
| joule-inverse meter relationship                   | 5,034 117 01        | 0,000 000 22      | 10 <sup>24</sup>  | m <sup>-1</sup>                               |
| nuclear magneton                                   | 5,050 783 53        | 0,000 000 11      | 10 <sup>-28</sup> | J T <sup>-1</sup>                             |
| electron mass energy equivalent in MeV $W_0$       | 5,109 989 28        | 0,000 000 11      | 10 <sup>-1</sup>  | MeV   |
| natural unit of energy in MeV $W_0$                | 5,109 989 28        | 0,000 000 11      | 10 <sup>-1</sup>  | MeV   |
| natural unit of mom.um in MeV/c <sub>0</sub> $p_e$ | 5,109 989 28        | 0,000 000 11      | 10 <sup>-1</sup>  | MeV/c   |
| atomic unit of electric field                      | 5,142 206 52        | 0,000 000 11      | 10 <sup>11</sup>  | V m <sup>-1</sup>                             |
| proton-tau mass ratio                              | 5,280 63            | 0,000 48          | 10 <sup>-1</sup>  |   |
| neutron-tau mass ratio                             | 5,287 90            | 0,000 48          | 10 <sup>-1</sup>  |   |
| atomic unit of length $a_0$                        | 5,291 772 1092      | 0,000 000 0017    | 10 <sup>-11</sup> | m   |
| Bohr radius $a_0$                                  | 5,291 772 1092      | 0,000 000 0017    | 10 <sup>-11</sup> | m   |
| Planck time $t_{Pl}$                               | 5,391 06            | 0,000 32          | 10 <sup>-44</sup> | s   |
| lattice parameter of silicon                       | 5,431 020 504       | 0,000 000 089     | 10 <sup>-10</sup> | m   |
| electron-neutron mass ratio                        | 5,438 673 4472      | 0,000 000 0047    | 10 <sup>-4</sup>  |   |
| electron-proton mass ratio                         | 5,446 170 2189      | 0,000 000 0042    | 10 <sup>-4</sup>  |   |
| electron mass in u $m_{e0}$                        | 5,485 799 0957      | 0,000 000 0042    | 10 <sup>-4</sup>  | u   |
| electron molar mass                                | 5,485 799 0957      | 0,000 000 0042    | 10 <sup>-7</sup>  | kg mol <sup>-1</sup>                          |
| helion-electron mass ratio                         | 5,495 885 2743      | 0,000 000 0062    | 10 <sup>3</sup>   |   |
| triton-electron mass ratio                         | 5,496 921 5256      | 0,000 000 0062    | 10 <sup>3</sup>   |   |
| proton g factor                                    | 5,585 694 712       | 0,000 000 046     |                   |   |
| kilogram-electron volt relationship                | 5,609 588 85        | 0,000 000 12      | 10 <sup>35</sup>  | eV  |
| Stefan-Boltzmann constant $\sigma$                 | 5,670 373           | 0,000 021         | 10 <sup>-8</sup>  | W m <sup>-2</sup> K <sup>-4</sup>             |
| Bohr magneton in eV/T                              | 5,788 381 8066      | 0,000 000 0038    | 10 <sup>-5</sup>  | eV T <sup>-1</sup>                            |
| Wien frequency displacement law constant           | 5,878 9254          | 0,000 0053        | 10 <sup>10</sup>  | Hz K <sup>-1</sup>                            |
| muon-tau mass ratio                                | 5,946 49            | 0,000 54          | 10 <sup>-2</sup>  |   |
| triton g factor                                    | 5,957 924 895       | 0,000 000 076     |                   |   |
| alpha particle mass energy equivalent              | 5,971 919 67        | 0,000 000 26      | 10 <sup>-10</sup> | J   |
| Avogadro constant $N_A$                            | 6,022 141 29        | 0,000 000 27      | 10 <sup>23</sup>  | mol <sup>-1</sup>                             |
| kilogram-atomic mass unit relationship             | 6,022 141 29        | 0,000 000 27      | 10 <sup>26</sup>  | u   |
| atomic unit of 2 <sup>nd</sup> hyperpolarizability | 6,235 380 54        | 0,000 000 28      | 10 <sup>-65</sup> | C <sup>4</sup> m <sup>4</sup> J <sup>-3</sup> |
| joule-electron volt relationship $1J$              | 6,241 509 34        | 0,000 000 14      | 10 <sup>18</sup>  | eV  |
| kilogram-kelvin relationship                       | 6,509 6582          | 0,000 0059        | 10 <sup>39</sup>  | K   |
| hartree-hertz relationship                         | 6,579 683 920 729   | 0,000 000 000 033 | 10 <sup>15</sup>  | Hz  |

|  |   |                  |                |                   |   |
|--|---|------------------|----------------|-------------------|---|
| electron-proton mag. mom. ratio  |   | 6,582 106 848    | 0,000 000 054  | 10 <sup>2</sup>   |   |
| natural unit of action in eV s   |   | 6,582 119 28     | 0,000 000 15   | 10 <sup>-16</sup> | eV s  |
| Planck constant over 2π in eV s  |   | 6,582 119 28     | 0,000 000 15   | 10 <sup>-16</sup> | eV s  |
| electron to shielded proton mag. mom. ratio  | – | 6,582 275 971    | 0,000 000 072  | 10 <sup>2</sup>   |   |
| atomic unit of current   |   | 6,623 617 95     | 0,000 000 15   | 10 <sup>-3</sup>  | A   |
| hertz-joule relationship   |   | 6,626 069 57     | 0,000 000 29   | 10 <sup>-34</sup> | J   |
| Planck constant <b>h</b>   |   | 6,626 069 57     | 0,000 000 29   | 10 <sup>-34</sup> | J s   |
| alpha particle mass  |   | 6,644 656 75     | 0,000 000 29   | 10 <sup>-27</sup> | kg  |
| Thomson cross section <b>σ<sub>e</sub></b>   |   | 6,652 458 734    | 0,000 000 013  | 10 <sup>-29</sup> | m <sup>2</sup>                                  |
| Newtonian constant of gravitation <b>G</b>   |   | 6,673 84         | 0,000 80       | 10 <sup>-11</sup> | m <sup>3</sup> kg <sup>-1</sup> s <sup>-2</sup> |
| joule-atomic mass unit relationship  |   | 6,700 535 85     | 0,000 000 30   | 10 <sup>9</sup>   | u   |
| Newtonian constant of gravitation over $\hbar c_0$   |   | 6,708 37         | 0,000 80       | 10 <sup>-39</sup> | (GeV/c <sup>2</sup> ) <sup>-2</sup>             |
| Bohr magneton in K/T   |   | 6,717 1388       | 0,000 0061     | 10 <sup>-1</sup>  | K T <sup>-1</sup>                               |
| neutron-proton mag. mom. ratio   |   | 6,849 7934       | 0,000 0016     | 10 <sup>-1</sup>  |   |
| neutron to shielded proton mag. mom. ratio   | – | 6,849 9694       | 0,000 0016     | 10 <sup>-1</sup>  |   |
| Boltzmann constant in inverse meters per kelvin  |   | 6,950 3476       | 0,000 0063     | 10 <sup>1</sup>   | m <sup>-1</sup> K <sup>-1</sup>                 |
| kelvin-inverse meter relationship  |   | 6,950 3476       | 0,000 0063     | 10 <sup>1</sup>   | m <sup>-1</sup>                                 |
| tau Compton wavelength   |   | 6,977 87         | 0,000 63       | 10 <sup>-16</sup> | m   |
| joule-kelvin relationship  |   | 7,242 9716       | 0,000 0066     | 10 <sup>22</sup>  | K   |
| quantum of circulation times 2 <b>h/m<sub>e0</sub></b>   |   | 7,273 895 1040   | 0,000 000 0047 | 10 <sup>-4</sup>  | m <sup>2</sup> s <sup>-1</sup>                  |
| alpha particle-electron mass ratio   |   | 7,294 299 5347   | 0,000 000 0056 | 10 <sup>3</sup>   |   |
| fine-structure constant <b>α</b>   |   | 7,297 352 5698   | 0,000 000 0024 | 10 <sup>-3</sup>  |   |
| hertz-kilogram relationship  |   | 7,372 496 68     | 0,000 000 33   | 10 <sup>-51</sup> | kg  |
| atomic mass unit-inverse meter relationship  |   | 7,513 006 6027   | 0,000 000 0075 | 10 <sup>14</sup>  | m <sup>-1</sup>                                 |
| shielded helion to proton mag. mom. ratio  | – | 7,617 665 58     | 0,000 000 11   | 10 <sup>-1</sup>  |   |
| shielded helion to shielded proton mag.mom.ratio   | – | 7,617 861 313    | 0,000 000 033  | 10 <sup>-1</sup>  |   |
| nuclear magneton in MHz/T  |   | 7,622 593 57     | 0,000 000 17   |                   | MHz T <sup>-1</sup>                             |
| conductance quantum <b>G<sub>0</sub></b>   |   | 7,748 091 7346   | 0,000 000 0025 | 10 <sup>-5</sup>  | S   |
| atomic unit of magnetizability   |   | 7,891 036 607    | 0,000 000 013  | 10 <sup>-29</sup> | J T <sup>-2</sup>                               |
| electron volt-inverse meter relationship   |   | 8,065 544 29     | 0,000 000 18   | 10 <sup>5</sup>   | m <sup>-1</sup>                                 |
| electron mass energy equivalent <b>W<sub>0</sub> = m<sub>e0</sub>c<sub>0</sub><sup>2</sup></b> |   | 8,187 105 06     | 0,000 000 36   | 10 <sup>-31</sup> | J   |
| natural unit of energy <b>W<sub>0</sub></b>  |   | 8,187 105 06     | 0,000 000 36   | 10 <sup>-14</sup> | J   |
| atomic unit of force   |   | 8,238 722 78     | 0,000 000 36   | 10 <sup>-8</sup>  | N   |
| molar gas constant <b>R</b>  |   | 8,314 4621       | 0,000 0075     |                   | J mol <sup>-1</sup> K <sup>-1</sup>             |
| atomic unit of electric dipole mom.  |   | 8,478 353 26     | 0,000 000 19   | 10 <sup>-30</sup> | C m   |
| deuteron g factor  |   | 8,574 382 306    | 0,000 000 072  | 10 <sup>-1</sup>  |   |
| deuteron mag. mom. to nuclear magneton ratio   |   | 8,574 382 306    | 0,000 000 072  | 10 <sup>-1</sup>  |   |
| Boltzmann constant in eV/K   |   | 8,617 3324       | 0,000 0078     | 10 <sup>-5</sup>  | eV K <sup>-1</sup>                              |
| kelvin-electron volt relationship  |   | 8,617 3324       | 0,000 0078     | 10 <sup>-5</sup>  | eV  |
| electron to shielded helion mag. mom. ratio  |   | 8,640 582 57     | 0,000 000 10   | 10 <sup>2</sup>   |   |
| proton rms charge radius   |   | 8,775            | 0,051          | 10 <sup>-16</sup> | m   |
| electric constant <b>ε<sub>0</sub></b>   |   | 8,854 187 817... | (exact)        | 10 <sup>-12</sup> | F m <sup>-1</sup>                               |
| proton-muon mass ratio   |   | 8,880 243 30     | 0,000 000 22   |                   |   |
| muon mag. mom. to nuclear magneton ratio   | – | 8,890 596 97     | 0,000 000 22   |                   |   |
| neutron-muon mass ratio  |   | 8,892 484 00     | 0,000 000 22   |                   |   |
| kilogram-joule relationship  |   | 8,987 551 787... | (exact)        | 10 <sup>16</sup>  | J   |
| atomic unit of mass <b>m<sub>e0</sub></b>  |   | 9,109 382 91     | 0,000 000 40   | 10 <sup>-31</sup> | kg  |
| electron mass <b>m<sub>e0</sub></b>  |   | 9,109 382 91     | 0,000 000 40   | 10 <sup>-31</sup> | kg  |
| natural unit of mass <b>m<sub>e0</sub></b>   |   | 9,109 382 91     | 0,000 000 40   | 10 <sup>-31</sup> | kg  |
| kelvin-atomic mass unit relationship   |   | 9,251 0868       | 0,000 0084     | 10 <sup>-14</sup> | u   |
| Bohr magneton <b>μ<sub>B</sub></b>   |   | 9,274 009 68     | 0,000 000 20   | 10 <sup>-24</sup> | J T <sup>-1</sup>                               |
| electron mag. mom. <b>μ<sub>e</sub></b>  | – | 9,284 764 30     | 0,000 000 21   | 10 <sup>-24</sup> | J T <sup>-1</sup>                               |
| atomic mass constant energy equivalent in MeV  |   | 9,314 940 61     | 0,000 000 21   | 10 <sup>2</sup>   | MeV   |
| atomic mass unit-electron volt relationship  |   | 9,314 940 61     | 0,000 000 21   | 10 <sup>8</sup>   | eV  |
| proton mass energy equivalent in MeV   |   | 9,382 720 46     | 0,000 000 21   | 10 <sup>2</sup>   | MeV   |
| neutron mass energy equivalent in MeV  |   | 9,395 653 78     | 0,000 000 21   | 10 <sup>2</sup>   | MeV   |
| proton charge to mass quotient   |   | 9,578 833 58     | 0,000 000 21   | 10 <sup>7</sup>   | C kg <sup>-1</sup>                              |
| electron-neutron mag. mom. ratio   |   | 9,609 2050       | 0,000 0023     | 10 <sup>2</sup>   |   |
| Faraday constant for conventional electric current   |   | 9,648 533 21     | 0,000 000 43   | 10 <sup>4</sup>   | C_90 mol <sup>-1</sup>                          |
| Faraday constant <b>F</b>  |   | 9,648 533 65     | 0,000 000 21   | 10 <sup>4</sup>   | C mol <sup>-1</sup>                             |
| neutron mag. mom.  | – | 9,662 3647       | 0,000 0023     | 10 <sup>-27</sup> | J T <sup>-1</sup>                               |
| atomic unit of electric field gradient   |   | 9,717 362 00     | 0,000 000 21   | 10 <sup>21</sup>  | V m <sup>-2</sup>                               |
| standard acceleration of gravity <b>g</b>  |   | 9,806 65         | (exact)        |                   | m s <sup>-2</sup>                               |
| proton-neutron mass ratio  |   | 9,986 234 7826   | 0,000 000 0045 | 10 <sup>-1</sup>  |   |