Gravitational Transformation of Units and Constants: The following are transformations of units of physics from zero gravity $\Gamma = 1$ to a location in gravity $\Gamma > 1$. The relationships are expressed assuming a single rate of time and proper length. The gravitational gamma Γ is defined as: $\Gamma \equiv \dfrac{dt}{d\tau} = \dfrac{1}{\sqrt{1-\left(\frac{2Gm}{c^2 R}\right)}} \approx 1 + Gm/c^2 R$. The symbols of dimensional analysis L, T, M, Q and Θ are used to represent length, time, mass, charge and temperature respectively.

Normalized Transformations

$L_o = L_g$	unit of length transformation
$T_o = T_g/\Gamma$	unit of time transformation
$M_o = M_g/\Gamma$	unit of mass transformation
$Q_o = Q_g$	unit of charge expressed in coulombs – not stat coulombs
$\Theta_o = \Theta_g$	unit of temperature transformation
$C_o = \Gamma\, C_g$	normalized speed of light transformation
$dL = \Gamma\, dR$	proper length and circumferential radius transformation

$E_o = \Gamma E_g$	energy
$v_o = \Gamma v_g$	velocity
$F_o = \Gamma F_g$	force
$P_o = \Gamma^2 P_g$	power
$G_o = \Gamma^3 G_g$	gravitational constant
$U_o = \Gamma U_g$	energy density
$\mathbb{P}_o = \Gamma \mathbb{P}_g$	pressure
$\omega_o = \Gamma \omega_g$	frequency
$\rho_o = \rho_g/\Gamma$	density
$k_o = \Gamma\, k_g$	Boltzmann's constant
$\sigma_o = \Gamma^2\, \sigma_g$	Stefan-Boltzmann Constant
$\mathbb{I}_o = \Gamma \mathbb{I}_g$	electrical current
$\mathbb{V}_o = \Gamma\, \mathbb{V}_g$	voltage
$\varepsilon_{oo} = \varepsilon_{og}/\Gamma$	permittivity of vacuum
$\mu_{oo} = \mu_{og}/\Gamma$	permeability of vacuum

Units and Constants That Do Not Change in Gravity

$p_o = p_g$	momentum is conserved
$\mathcal{L}_o = \mathcal{L}_g$	angular momentum is conserved
$\hbar_o = \hbar_g$	Planck's constant (angular momentum is conserved)
$\alpha_o = \alpha_g$	fine structure constant (dimensionless constant is conserved)
$\Omega_o = \Omega_g$	electrical resistance
$\mathbb{B}_o = \mathbb{B}_g$	magnetic flux density
$Z_{oo} = Z_{og}$	impedance of free space
$Z_{so} = Z_{sg}$	impedance of spacetime

Fundamental Equations

$E_o = E_g + E_k$	relationship of internal energy and gravitational kinetic energy E_k
$E_o = E_g - E_{po}$	relationship of internal energy and gravitational potential energy E_{po}