$$B(r,\lambda) = \frac{\mu_o M}{4\pi r^3}(1+3\sin^2\lambda)^{\frac{1}{2}}$$

$$c_s = (\frac{\gamma P}{\rho})^{1/2}$$

$$\rho \, \mathrm{v}^2$$

$$\boldsymbol{F} = m\frac{d\boldsymbol{V}}{dt} = q(\boldsymbol{E} + \boldsymbol{V}x\boldsymbol{B})$$

$$J = \int \rho_{\parallel} ds \sim \rho_{\parallel}\Delta s$$

$$\mu = \frac{\frac{1}{2}m\mathrm{v}_{\perp}^2}{B}$$

$$\mathrm{r} = \mathrm{r_o}\cos^2\lambda$$

$$T = T_o\left(\frac{\mathrm{z}}{\mathrm{z_o}}\right)^{\frac{-2}{7}}$$

$$\beta = \frac{P}{B^2 / 2\mu_0}$$

$$\omega_c = \frac{qB}{m}$$

$$\nabla\cdot(\mathrm{B}\times\mathrm{C}) = \mathrm{C}\cdot(\nabla\times\mathrm{B}) - \mathrm{B}\cdot(\nabla\times\mathrm{C})$$

$$N_D = \frac{4\pi}{3}n_0\lambda_D^3$$

$$V_A = \frac{B}{\sqrt{(\mu_0\rho)}}$$

$$\frac{d\boldsymbol{V}}{dt} = \frac{q}{m}(\boldsymbol{E} + \boldsymbol{V}x\boldsymbol{B})$$

$$\mathrm{r}^2 B = const$$

$$\frac{\partial}{\partial t}(\frac{1}{2}mn\mathrm{v}^2) + \frac{\partial}{\partial x_i}(n < \frac{1}{2}m\mathrm{v}_i\mathrm{v}^2 >) = n < (\mathbf{E} + \mathbf{v}x\mathbf{B})_i \mathrm{v}_i >$$

$$t_D = \mu_0\sigma L^2$$

$$\nabla\times(\mathrm{A}\times\mathrm{B}) = \mathrm{A}\cdot(\nabla\cdot\mathrm{B}) - \mathrm{B}\cdot(\nabla\cdot\mathrm{A}) + (\mathrm{B}\cdot\nabla)\mathrm{A} - (\mathrm{A}\cdot\nabla)\mathrm{B}$$

$$\frac{B_r}{B_\phi} = -\frac{u_{sw}}{\omega r}$$

$$< M^\alpha(\mathbf{r},t) >= \frac{\int M f^\alpha(\mathbf{r},\mathbf{v};t)d^3\mathrm{v}}{\int f^\alpha(\mathbf{r},\mathbf{v};t)d^3\mathrm{v}}$$

$$\boldsymbol{B} = \mu_0\boldsymbol{H}$$

$$\mathbf{v} = \frac{\mathbf{E}\times\mathbf{B}}{B^2}$$

$$(\frac{\mathrm{u}^2}{\mathrm{c_s^2}} - 1)\frac{\mathrm{du}}{\mathrm{u}} = (2 - \frac{\mathrm{GM}}{\mathrm{rc_s^2}})\frac{dr}{r}$$

$$\frac{\sin^2\alpha_1}{B_1} = \frac{\sin^2\alpha_2}{B_2}$$

$$\mathbf{v}_{\nabla B} = \frac{\frac{1}{2}m\mathrm{v}_{\perp}^2}{qB^3}(\mathbf{B}\times\nabla B)$$

$$\omega_p^2 = \frac{\mathrm{n}_o q^2}{\mathrm{m}\ \varepsilon_{\mathrm{o}}}$$

$$\frac{\partial \mathbf{B}}{\partial t} = \frac{1}{\mu_0 \sigma} \nabla^2 \mathbf{B} + \nabla \times (\mathbf{u} \times \mathbf{B})$$

$$\mathbf{E} = -\mathbf{u} \times \mathbf{B} + \eta \mathbf{J}$$

$$f(\mathbf{v}) = n\left(\frac{m}{2\pi KT}\right)^{3/2} \exp\left(\frac{-m\mathbf{v} \bullet \mathbf{v}}{2KT}\right)$$

$$r_c = \frac{\mathrm{mv}_\perp}{\mathrm{qB}}$$

$$\frac{d}{dt}(P\rho_m{}^{-\gamma}) \equiv 0$$

$$\nabla x \boldsymbol{B} = \mu_0 \boldsymbol{J} + \mu_0 \varepsilon_0 \frac{\partial \boldsymbol{E}}{\partial t}$$

$$\frac{dn}{dt} + \nabla \bullet (n\mathbf{v}) = 0$$

$$\frac{d}{dt}\left(\frac{P}{\rho_m}\right) \equiv 0$$

$$\mathrm{v}_\perp = \mathrm{v} \sin\alpha$$

$$\mathrm{v}_{\mathrm{esc}} = \left(\frac{2\mathrm{GM}_{\mathrm{e}}}{\mathrm{R}_{\mathrm{e}}}\right)^{\frac{1}{2}}$$

$$\psi = \frac{q}{4\pi\varepsilon_0 r} e^{-r/\lambda_D}$$

$$\frac{\mathrm{B}^2}{2\mu_o}$$

$$\mathrm{A} \times (\mathrm{B} \times \mathrm{C}) = (\mathrm{A} \cdot \mathrm{C})\mathrm{B} - (\mathrm{A} \cdot \mathrm{B})\mathrm{C}$$

$$\mathbf{J} = n_+ \mathbf{u}_+ q_+ + n_- \mathbf{u}_- q_-$$

$$\boldsymbol{D} = \varepsilon_0 \boldsymbol{E}$$

$$\frac{\partial}{\partial t}(nm\mathrm{v}_i) + \frac{\partial}{\partial x_i}(nm < \mathrm{v}_i \mathrm{v}_j >) = qn < \mathbf{E} + \mathbf{v} x \mathbf{B} >_i$$

$$\nabla x \boldsymbol{E} = \frac{-\partial \boldsymbol{B}}{\partial t}$$

$$\lambda_D = \left(\frac{kT_e \varepsilon_0}{n_0 q_e{}^2}\right)^{\frac{1}{2}}$$

$$\mathbf{v}_d = \frac{\mathbf{F}_\perp \times \mathbf{B}}{qB^2}$$

$$\mathrm{nvr}^2 = const$$

$$\nabla \cdot \mathbf{E} = \frac{\rho}{\varepsilon_0}$$

$$\frac{\mathrm{P}}{\gamma - 1}$$

$$\mathbf{v}_c = \frac{m\mathrm{v}_\parallel^2}{qB^4} \mathbf{B} \times \left(\nabla \frac{B^2}{2}\right)$$

$$\nabla \cdot \mathbf{B} = 0$$

$$\mu = \frac{\frac{1}{2} m\mathrm{v}_\perp^2}{B}$$

$$g = \frac{1}{N_D}$$

$$\boldsymbol{J} = \frac{\lim}{\Delta \mathrm{V} \to 0} \frac{\sum_{\Delta V} q_K \boldsymbol{V}_K}{\Delta V}$$

$$\rho = \frac{\lim}{\Delta V \to 0} \frac{\sum_{\Delta V} q_K}{\Delta V}$$

$$\frac{\partial \mathbf{u}}{\partial t} + (\mathbf{u} \bullet \nabla)\mathbf{u} + 2\Omega \times \mathbf{u} = -\frac{1}{\rho} \nabla P - \mathbf{g} + \nu \nabla^2 \mathbf{u} + \mathbf{J} \times \mathbf{B} + \rho_c \mathbf{E}$$

$$R_M = \mu_0 \sigma L u$$

$$\mathbf{E} = -\mathbf{v} \times \mathbf{B} + \eta \mathbf{J} + \frac{1}{en_e}(\mathbf{J} \times \mathbf{B} - \nabla P_e)$$

$$\mathrm{A} \cdot (\mathrm{B} \times \mathrm{C}) = \mathrm{C} \cdot (\mathrm{A} \times \mathrm{B}) = \mathrm{B} \cdot (\mathrm{C} \times \mathrm{A})$$