Vortex Æther Model: Core Equations and Constants

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Symbol	Description
V	Mass of liquid in circular motion (Vortex)
Γ	Vortex circulation strength: $\oint \mathbf{v} \cdot d\mathbf{s}$
ω	Vorticity magnitude $\nabla \times \mathbf{v}$
Φ	Vorticity-induced potential function, satisfying $\nabla^2 \Phi = -\omega$.
R	Characteristic vortex radius, representing the scale of rotation.
λ	Vortex core parameter, related to the characteristic decay length of vorticity.
L	Rotational vortex core length
Ψ	Stream function of vortex motion $\mathbf{v} = \nabla \times \Psi$.
Ψ_k	Vortex knot function describing topological structures in the Æther.
$\rho_{æ}$	Local Æther density, assumed to be incompressible in the model.
P	Pressure in the Æther model, often governed by Bernoulli-like principles.
H	Helicity, a measure of the knottedness of vortex tubes: $H = \int \mathbf{v} \cdot \omega \, dV$.
K	Enstrophy, representing rotational energy density: $K = \frac{1}{2} \int \omega^2 dV$.
$\mathbf{v}$	Velocity vector field
$\mathbf{\Omega}$	Angular velocity vector
$\mathbf{A}$	Vector potential, where $\mathbf{B} = \nabla \times \mathbf{A}$ in magnetohydrodynamic analogies.
$\mathbf{J}$	Vortex current density, defined by $\mathbf{J} = \nabla \times \omega$.

Table 1: Glossary of Terms for Incompressible Non-Viscous Liquid Æther

Symbol	**Value**	**Unit**	**Quantity**
C_e	1.09384563×10^{6}	m s^{-1}	Vortex-Core Tangential Velocity
F_c	29.053507	N	Coulomb Force
r_c	$1.40897017 \times 10^{-15}$	m	Vortex-Core Radius
R_e	$2.8179403262 \times 10^{-15}$	m	Classical Electron Radius
c	2.99792458×10^{8}	m s^{-1}	Speed of Light in Vacuum
α_g	1.7518×10^{-45}	-	Gravitational Coupling Constant
G	6.67430×10^{-11}	$m^3 kg^{-1} s^{-2}$	Newtonian Constant of Gravitation
h	$6.62607015 \times 10^{-34}$	J Hz^{-1}	Planck Constant
α	$7.2973525643 \times 10^{-3}$	-	Fine-Structure Constant
a_0	$5.29177210903 \times 10^{-11}$	m	Bohr Radius
M_e	$9.1093837015 \times 10^{-31}$	kg	Electron Mass
M_{proton}	$1.67262192369 \times 10^{-27}$	kg	Proton Mass
M_{neutron}	$1.67492749804 \times 10^{-27}$	kg	Neutron Mass
k_B	1.380649×10^{-23}	J K^{-1}	Boltzmann Constant
R	8.314462618	J $mol^{-1} K^{-1}$	Gas Constant
λ_c	$2.42631023867 \times 10^{-12}$	m	Electron Compton Wavelength

Table 2: List of Physical Constants Used in the Vortex Æther Model (VAM)

$$_e = \frac{\lambda_c}{2\pi}\alpha$$
$$_e = \frac{e^2}{4\pi\varepsilon_0 M_e c^2}$$
$$_e = 2R_c$$
$$_e = \alpha^2 a_0$$
$$_e = \frac{e^2}{4\pi\varepsilon_c m_c c^2}$$
$$_e = \frac{e^2}{8\pi\varepsilon_0 F_{\max} R_c}$$
$$R_x = N\frac{F_{\max}R_c^2}{M_e Z C_e^2}$$
$$e = \frac{\sqrt{16\pi F_{max} R_c^2}}{\mu_0 c^2}$$
$$e^2 = 16\pi F_{max}\xi_0 R_e^2$$
$$e = \frac{\sqrt{2\alpha h}}{\mu_0 c}$$
$$e = \frac{\sqrt{4C_e h}}{\mu_0 c^2}$$
$$R^2 = \frac{NF_{\max}\,R_c}{4\pi^2 f^2 m_e}$$
$$R^2 = \frac{4\pi F_{\max}R_c^2}{C_e}\frac{1}{8\pi^2 M_e f_e}$$
$$\frac{1}{R_c} = \frac{c^2}{a_0 2C_e^2}$$
$$L_p = \sqrt{\frac{\hbar G}{c^3}}$$
$$L_{planck} = \frac{\lambda_e C_e t_{planck}}{2\pi R_c}$$
$$L_{\text{Planck}} = \sqrt{\frac{\alpha_g \hbar R_c}{C_e M_e}}.$$
$$L_{\text{Planck}} = \sqrt{\frac{\hbar t_p^2 C_e c^2}{2F_{\max}R_c^2}}.$$
$$G = \frac{\vec{C}_e c^3 l_p^2}{2F_{\max}{R_c}^2}$$
$$G = \frac{C_e c^3 t_p^2}{R_c m_e}$$
$$G = \frac{F_{\max}\alpha(ct_p)^2}{m_e^2}$$
$$G = \frac{C_e c L_{\text{Planck}}^2}{R_c M_e}.$$
$$G = \frac{\alpha_g c^3 R_c}{C_e M_e}$$
$$G = \frac{C_e c^3 t_p^2}{R_c \frac{2F_{\max}R_c}{c^2}} = \frac{C_e c^5 t_p^2}{2F_{\max}R_c^2}.$$
$$\alpha = \frac{\lambda_e}{4\pi R_c}$$
$$\alpha = \frac{C_e e^2}{8\pi\varepsilon_0 R_c^2 c F_{\max}}$$
$$\alpha = \frac{\lambda_c}{4\pi R_c}$$
$$2\alpha^{-}1 = \frac{\omega_c R_c}{C_e}$$
$$\frac{c}{2\alpha}e^2 \qquad\qquad ^2 \qquad\qquad e^2$$

1 Validated VAM Equations

$$R_e = \frac{e^2}{4\pi\varepsilon_0 M_e c^2} \tag{3}$$

(3)

$$R_e = 2r_c \tag{4}$$

$$R_e = \alpha^2 a_0 \tag{5}$$

$$R_e = \frac{e^2}{4\pi\varepsilon_c m_c c^2} \tag{6}$$

$$R_e = \frac{e^2}{8\pi\varepsilon_0 F_{\max} r_c} \tag{7}$$

$$R_x = N\frac{F_{\max} r_c^2}{M_e Z C_e^2} \tag{8}$$

$$e = \frac{\sqrt{16\pi F_{\max} r_c^2}}{\mu_0 c^2} \tag{9}$$

$$e^2 = 16\pi F_{\max}\xi_0 R_e^2 \tag{10}$$

$$e = \frac{\sqrt{2\alpha h}}{\mu_0 c} \tag{11}$$

$$e = \frac{\sqrt{4C_e h}}{\mu_0 c^2} \tag{12}$$

$$R^2 = \frac{N F_{\max}\, r_c}{4\pi^2 f^2 m_e} \tag{13}$$

$$R^2 = \frac{4\pi F_{\max} r_c^2}{C_e}\frac{1}{8\pi^2 M_e f_e} \tag{14}$$

$$\frac{1}{r_c} = \frac{c^2}{a_0 2C_e^2} \tag{15}$$

$R_e = \frac{\lambda_c}{2\pi}\alpha$(16)

$$R_e = \frac{e^2}{4\pi\varepsilon_0 M_e c^2} \tag{17}$$

$$R_e = 2r_c \tag{18}$$

$$R_e = \alpha^2 a_0 \tag{19}$$

$$R_e = \frac{e^2}{4\pi\varepsilon_c m_c c^2} \tag{20}$$

$$R_e = \frac{e^2}{8\pi\varepsilon_0 F_{\max} r_c} \tag{21}$$

$$R_x = N\frac{F_{\max} r_c^2}{M_e Z C_e^2} \tag{22}$$

$$e = \frac{\sqrt{16\pi F_{\max} r_c^2}}{\mu_0 c^2} \tag{23}$$

$$e^2 = 16\pi F_{\max}\xi_0 R_e^2 \tag{24}$$

$$e = \frac{\sqrt{2\alpha h}}{\mu_0 c} \tag{25}$$

$$e = \frac{\sqrt{4C_e h}}{\mu_0 c^2} \tag{26}$$

$$R^2 = \frac{N F_{\max}\, r_c}{4\pi^2 f^2 m_e} \tag{27}$$

$$R^2 = \frac{4\pi F_{\max} r_c^2}{C_e} \frac{1}{8\pi^2 M_e f_e} \tag{28}$$

$$\frac{1}{r_c} = \frac{c^2}{a_0 2 C_e^2} \tag{29}$$