1 Known Errors in *The Theory of Scintillation...* by C. L. Rino

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1.1 Chapter 2

Errors:

P. 23 *Wyle* should be *Weil*

1.2 Chapter 3

Errors:

P. 51 Equation (3.7) should be

$$\begin{aligned}\delta n_p &= -2\pi r_e \delta N_e c^2/\omega^2 \\ &= -2\pi r_e \delta N_e/k^2\end{aligned}$$

P. 63 The following definitions should have been included:

$$\begin{aligned}R_{\delta\overline{n}}(\Delta\boldsymbol{\zeta}) &= \int_{-\infty}^{\infty} R_{\delta n}(\eta, \Delta\boldsymbol{\zeta})\, d\eta \quad \text{units} \sim l \\ D_{\delta\overline{n}}(\Delta\boldsymbol{\zeta}) &= 2\left(R_{\delta\overline{n}}(0) - R_{\delta\overline{n}}(\Delta\boldsymbol{\zeta})\right) \quad \text{units} \sim l \\ D_{\delta\overline{\phi}}(\Delta\boldsymbol{\zeta}) &= k^2 D_{\delta\overline{n}}(\Delta\boldsymbol{\zeta}) \quad \text{units} \sim 1/l\end{aligned}$$

P. 66 Equation (3.64) should be

$$\begin{aligned}&\frac{\partial\Gamma_{22}(x,\boldsymbol{\zeta}_1,\boldsymbol{\zeta}_2;\boldsymbol{\xi}_1,\boldsymbol{\xi}_2)}{\partial x} = -\frac{i}{2k}\left[\nabla^2_{\boldsymbol{\zeta}_1} + \nabla^2_{\boldsymbol{\zeta}_2} - \nabla^2_{\boldsymbol{\xi}_1} - \nabla^2_{\boldsymbol{\xi}_1}\right]\Gamma_{2,2}(x,\cdots) \\ &-\frac{k^2}{2}\left[D_{\delta\overline{n}}(\boldsymbol{\zeta}_1 - \boldsymbol{\xi}_2) + D_{\delta\overline{n}}(\boldsymbol{\zeta}_2 - \boldsymbol{\xi}_1) + D_{\delta\overline{n}}(\boldsymbol{\zeta}_2 - \boldsymbol{\xi}_2) + \right. \\ &\left. D_{\delta\overline{n}}(\boldsymbol{\zeta}_1 - \boldsymbol{\xi}_1) - D_{\delta\overline{n}}(\boldsymbol{\zeta}_1 - \boldsymbol{\zeta}_2) - D_{\delta\overline{n}}(\boldsymbol{\xi}_1 - \boldsymbol{\xi}_2)\right]\Gamma_{2,2}(x,\cdots)\end{aligned}$$

P. 66 Equation (3.69) should be

$$\begin{aligned}&\frac{\partial\Gamma_{22}(x,\boldsymbol{\alpha}_0,\boldsymbol{\alpha};\boldsymbol{\alpha}_1,\boldsymbol{\alpha}_2)}{\partial x} = \frac{i}{k}\left[\nabla_{\alpha_0}\cdot\nabla_{\alpha} - \nabla_{\alpha_1}\cdot\nabla_{\alpha_2}\right]\Gamma_{22}(x,\cdots) + \\ &\frac{k^2}{2}\left[D_{\delta\overline{n}}(\boldsymbol{\alpha}_1 + \boldsymbol{\alpha}/2) + D_{\delta\overline{n}}(\boldsymbol{\alpha}_1 - \boldsymbol{\alpha}/2) + D_{\delta\overline{n}}(\boldsymbol{\alpha}_2 - \boldsymbol{\alpha}/2) + \right. \\ &\left. D_{\delta\overline{n}}(\boldsymbol{\alpha}_2 + \boldsymbol{\alpha}/2) - D_{\delta\overline{n}}(\boldsymbol{\alpha}_1 + \boldsymbol{\alpha}_2) - D_{\delta\overline{n}}(\boldsymbol{\alpha}_1 - \boldsymbol{\alpha}_2)\right]\Gamma_{22}(x,\cdots).\end{aligned}$$

P.67 Equation (3.70) should be

$$\begin{aligned}&\frac{\partial\Gamma_{22}(x,\boldsymbol{\alpha}_1,\boldsymbol{\alpha}_2)}{\partial x} = -\frac{i}{k}\nabla_{\alpha_1}\cdot\nabla_{\alpha_2}\Gamma_{22}(x,\boldsymbol{\alpha}_1,\boldsymbol{\alpha}_2) - \\ &\frac{k^2}{2}\left[2D_{\delta\overline{n}}(\boldsymbol{\alpha}_1) + 2D_{\delta\overline{n}}(\boldsymbol{\alpha}_2) - \right. \\ &\left. D_{\delta\overline{n}}(\boldsymbol{\alpha}_2 + \boldsymbol{\alpha}_2) - D_{\delta\overline{n}}(\boldsymbol{\alpha}_1 - \boldsymbol{\alpha}_2)\right]\Gamma_{22}(x,\boldsymbol{\alpha}_1,\boldsymbol{\alpha}_2)\end{aligned}$$

P. 67 Equation (3.71) should be

$$\begin{aligned}\Gamma_{22}(x,\boldsymbol{\alpha}_1,\boldsymbol{\alpha}_2) &= \exp\left\{-xk^2\left[D_{\delta\overline{n}}(\boldsymbol{\alpha}_1)+D_{\delta\overline{n}}(\boldsymbol{\alpha}_2)\right.\right.\\ &\quad\left.\left.-D_{\delta\overline{n}}(\boldsymbol{\alpha}_1+\boldsymbol{\alpha}_2)/2-D_{\delta\overline{n}}(\boldsymbol{\alpha}_1-\boldsymbol{\alpha}_2)/2\right\}\right].\end{aligned}$$

P. 68 Equation (3.79) should be

$$\begin{aligned}\Gamma_{22}(0,\boldsymbol{\alpha}_1,\boldsymbol{\alpha}_2) &= \exp\left\{-k^2 l_p\left[D_{\delta\overline{n}}(\boldsymbol{\alpha}_1)+D_{\delta\overline{n}}(\boldsymbol{\alpha}_2)\right.\right.\\ &\quad\left.\left.-D_{\delta\overline{n}}(\boldsymbol{\alpha}_1+\boldsymbol{\alpha}_2)/2-D_{\delta\overline{n}}(\boldsymbol{\alpha}_1-\boldsymbol{\alpha}_2)/2\right]\right\}\end{aligned}$$

1.3 Chapter 4

Errors:

P. 103 Equation (4.3) should be

$$\begin{aligned}\mathbf{k} &= k\left[\cos\theta,\sin\theta\cos\phi,\sin\theta\sin\phi\right]\\ &= \left[kg(\mathbf{k}),\mathbf{k}_T\right],\end{aligned}$$

P. 103 Equation (4.3) should be

$$\begin{aligned}\widehat{\mathbf{a}}_{k_T} &= \mathbf{k}_T/k_T\\ &= \left[\cos\phi,\sin\phi\right].\end{aligned}$$

P. 1034 $\boldsymbol{\kappa}'$ in Equation (4.5) should be $\boldsymbol{\kappa}$

P. 109 Second sentence in last paragraph of Section 4.2.2 should read There is a $\sqrt{10}:1$ SI enhancement ...

P. 111 Equation (4.44) should be

$$D_{\delta\phi}(f(\Delta\boldsymbol{\rho}+\mathbf{v}_\mathbf{k}\Delta t))=k^2\vartheta\left\langle\delta n^2\right\rangle l_p\sec\theta\varkappa\left(1-\Re(f(\Delta\boldsymbol{\rho}+\mathbf{v}_\mathbf{k}\Delta t))\right)$$

P. 112 Equation (4.52) should be

$$\varphi(f)=\int R_{\psi_\mathbf{k}}(\mathbf{v}_k\Delta t)\exp\left\{-2\pi i f\Delta t\right\}d\Delta t$$

P. 112 Equation (4.54) should be

$$T=v_{\text{eff}}^{2\nu-1}\vartheta\sec\theta C_p\frac{\sqrt{\pi}\Gamma\left(\nu\right)}{\left(2\pi\right)^{2\nu+1}\Gamma\left(\nu+1/2\right)}$$

P. 122 Equation (4.73) should be

$$\left\langle\delta n^2\right\rangle=r_e^2\lambda^4\left\langle\delta N_e^2\right\rangle/\left(4\pi^2\right)$$

P. 122 Equation (4.75) should be

$$C_s=r_e^2\lambda^4\frac{2\pi^{1/2}\Gamma(\nu+1/2)}{\Gamma(\nu-1)}q_L^{2\nu-2}\left\langle\delta N_e^2\right\rangle$$

1.4 Chapter 5

Errors:

P.169 Equation (5.58) should be

$$\phi(t) = -2\pi r(t)/\lambda - r_e \lambda \overline{TEC} + \phi_{scint}(t; \lambda_1, r)$$

P. 170 Equation (5.59) should be

$$\begin{aligned} \Delta\phi(t) &= \phi_{VHF}(t) - (\lambda_{UHF}/\lambda_{VHF})\,\phi_{UHF}(t) \\ &= -r_e \lambda_{VHF}\left(1 - (\lambda_{UHF}/\lambda_{VHF})^2\right)\overline{TEC} - \Delta\phi_{scint} \end{aligned}$$