

$$\begin{cases} ix+jy+kz = \omega \\ iu+jv+kw = \Omega \end{cases} \quad \begin{cases} jk=1 \\ kv=j \\ ij=l \end{cases}$$

$$(u-u')(u-u') =$$

$$\frac{\partial u}{\partial x} dx + \frac{\partial u}{\partial y} dy + \frac{\partial u}{\partial z} dz = \frac{\partial u}{\partial x'} dx' + \frac{\partial u}{\partial y'} dy' + \frac{\partial u}{\partial z'} dz'$$

$$u-u' = \frac{\epsilon+\epsilon'}{2}(x-x')$$

$$u = l + \mu z - \nu y + \frac{1}{2} kx(lx + \mu y + \nu z) - \frac{1}{4} kl(x^2 + y^2 + z^2)$$

$$\begin{cases} u = l + \mu z - \nu y + \epsilon x - \frac{1}{4} kl(x^2 + y^2 + z^2) \\ u' = l + \mu z' - \nu y' + \epsilon' x' - \frac{1}{4} kl(x'^2 + y'^2 + z'^2) \end{cases}$$

$$u-u' = \mu(z-z') - \nu(y-y') + \epsilon x - \epsilon' x' - \frac{1}{4} kl(x^2 + y^2 + z^2 - x'^2 - y'^2 - z'^2)$$

$$u-u' = \frac{\epsilon+\epsilon'}{2}(x-x') = (\epsilon-\epsilon') \frac{x+x'}{2} + \mu(z-z') - \nu(y-y') - \frac{1}{4} kl(x^2 - x'^2)$$

$$Qx + Q'x' = \alpha - \epsilon$$

$$\begin{cases} x' = mx \\ y' = my \\ z' = mz \end{cases}$$

$$\epsilon' = \frac{k}{2} Q'(u'x' - 1) \cdot m$$

$$Qx(u-u') = \frac{\epsilon+\epsilon'}{2} [1-u] (x^2 + y^2 + z^2)$$

$$x' = -\frac{Qx}{Q'}$$

$$u-u' = \mu(z-z') - \nu(y-y')$$

$$x^2 = \frac{x}{Q'}$$

$$Q(x)$$

$$Qx + Q'x' = 0 \quad \frac{x}{Q'} \cdot \frac{1}{Q'} \cdot \frac{1}{Q'} (1-Q') = 0$$

$$Q(x+u) + Q'(x'+u') = 0$$

$$(1-\epsilon)Q(x) + (1-\epsilon')Q'(x'+u') = 0$$

$$Q(x+u) + Q'(x'+u') = \epsilon Qx + \epsilon' Q'x'$$

$$0 = (\epsilon-\epsilon') \frac{x+x'}{2} - \frac{1}{4} kl[(lx-x')^2 - \dots]$$

$$Q(u-\epsilon x) + Q'(u'-\epsilon' x') = 0$$

$$Q(u) = l + Q(\mu z - \nu y) + \frac{1}{2} kx(\mu y - \nu z) - \frac{1}{4} kl(lz - \nu x)$$

$$Q(u) = l + Q(\mu z - \nu y) - \frac{1}{4} kl(x^2 + y^2 + z^2)$$

$$u = l + \mu z - \nu y + \epsilon x - \frac{1}{4} kl(x^2 + y^2 + z^2)$$

$$Q(u) = l + Q'(\mu z' - \nu y') - \frac{1}{4} kl(x'^2 + y'^2 + z'^2)$$

$$u-u' = \mu(z-z') - \nu(y-y') + \epsilon x - \epsilon' x' - \frac{1}{4} kl[(x-x')(x+x') + (y-y')(y+y') + (z-z')(z+z')] + \epsilon x - \epsilon' x'$$

$$u-u' = \frac{\epsilon}{2}(x-x') + \frac{\epsilon'}{2}(x'-x) + \frac{1}{2} kx(lx + \mu y + \nu z)$$

$$x' = -\frac{Qx}{Q'} \quad \frac{1}{4} kl(x^2 + y^2 + z^2) \frac{Q}{Q'}$$

$$u-u' = \frac{\epsilon}{2}(x-x') - \frac{1}{4} kl(x'^2 + y'^2 + z'^2)$$

$$u-u' = \mu(z-z') - \nu(y-y') \quad Q = \frac{1}{2}, Q' = \frac{1}{2}$$

$$Q + \frac{Q'}{Q'} = 1 - \frac{1}{4} \frac{Q}{Q'} [1 - 1]$$

$$(x-x')(u-u') = \frac{k}{4} \cdot \frac{1}{4} \left[\frac{1}{4} + \frac{Q}{k} - 2(x+x') \right]$$

$$\frac{1}{2} = \frac{1}{4} \frac{Q}{Q'} (x^2 + y^2 + z^2)$$

$$2 \frac{\sin^2 \theta}{2} = \frac{1}{2} - \frac{k}{4} (x+x')$$

$$\frac{k}{4} (x+x') = 1 - 2 \frac{\sin^2 \theta}{2} = \cos^2 \theta$$