Algebra is $Cl_{1,4}(\mathbb{R})$
The five dimensions are (t, x, y, z, w).
It defines two sets of quaternions with one imaginary unit.
Signature is (+ - - - -)
CoQuaternions $(1, \mathbf{i}, \mathbf{j}, \mathbf{k})$ http://en.wikipedia.org/wiki/Split-quaternion

$$\mathbf{i} = \gamma_t$$

$$\mathbf{j} = \gamma_t\gamma_x\gamma_y\gamma_z$$

$$\mathbf{k} = \gamma_x\gamma_y\gamma_z$$

$$\mathbf{i}^2 = 1$$

$$\mathbf{j}^2 = -1$$

$$\mathbf{k}^2 = 1$$

$$\mathbf{ij} = \gamma_x\gamma_y\gamma_z$$

$$\mathbf{ji} = -\gamma_x\gamma_y\gamma_z$$

$$\mathbf{jk} = \gamma_t$$

$$\mathbf{kj} = -\gamma_t$$

$$\mathbf{ki} = -\gamma_t\gamma_x\gamma_y\gamma_z$$

$$\mathbf{ik} = \gamma_t\gamma_x\gamma_y\gamma_z$$

$$\mathbf{ijk} = 1$$

Quaternions $(1, \boldsymbol{i}, \boldsymbol{j}, \boldsymbol{k})$ http://en.wikipedia.org/wiki/Quaternion

$$\boldsymbol{i} = \gamma_y\gamma_z$$

$$\boldsymbol{j} = -\gamma_x\gamma_z$$

$$\boldsymbol{k} = \gamma_x\gamma_y$$

$$\boldsymbol{i}^2 = -1$$

$$\boldsymbol{j}^2 = -1$$

$$\boldsymbol{k}^2 = -1$$

$$\boldsymbol{ij} = \gamma_x\gamma_y$$

$$\boldsymbol{ji} = -\gamma_x\gamma_y$$

$$\boldsymbol{jk} = \gamma_y\gamma_z$$

$$\boldsymbol{kj} = -\gamma_y\gamma_z$$

$$\boldsymbol{ki} = -\gamma_x\gamma_z$$

$$\boldsymbol{ik} = \gamma_x\gamma_z$$

$$\boldsymbol{ijk} = -1$$

Imaginary unit i

$$i = \gamma_w$$

$$i^2 = -1$$

Gradient definition

$$\nabla = (\gamma_t \frac{\partial}{\partial t} + \gamma_x \frac{\partial}{\partial x} + \gamma_y \frac{\partial}{\partial y} + \gamma_z \frac{\partial}{\partial z} + \gamma_w \frac{\partial}{\partial w})$$

http://www.mrao.cam.ac.uk/ clifford/ptIIIcourse/course99/handouts/hout07.ps.gz
Wave : K is a constant and f is a function of (t, x, y, z, w)

$$\psi = Ke^f$$

Left and right derivatives
http://geocalc.clas.asu.edu/pdf/NFMPchapt1.pdf see chapter 1-3 Differentiation by vectors

$$\nabla\psi = \nabla(Ke^f)$$

$$\nabla\psi = (\nabla K)e^f + K\nabla(e^f)$$

$$\nabla K = 0$$

$$\nabla\psi_L = K(\nabla f)e^f$$

$$\nabla\psi_R = (\nabla f)Ke^f$$

The following symbols are defined :
$E \in \mathbb{R}$
$m \in \mathbb{R}$
$\mathbf{p}$ is defined with $p_x, p_y, p_z \in \mathbb{R}$

$$\mathbf{p} = p_x\boldsymbol{i} + p_y\boldsymbol{j} + p_z\boldsymbol{k}$$

$$\mathbf{p} = p_z\gamma_x\gamma_y - p_y\gamma_x\gamma_z + p_x\gamma_y\gamma_z$$

Exponential function f

$$f_1 = -mw + (p_y y + p_x x + p_z z - Et)\,\gamma_w$$

$$f_2 = mw + (-p_z z - p_y y - p_x x - Et)\,\gamma_w$$

$$f_3 = mw + (p_y y + p_x x + p_z z - Et)\,\gamma_w$$

$$f_4 = -mw + (-p_z z - p_y y - p_x x - Et)\,\gamma_w$$

Gradient for f

$$\nabla f_1 = m\gamma_w - E\gamma_t\gamma_w - p_x\gamma_x\gamma_w - p_y\gamma_y\gamma_w - p_z\gamma_z\gamma_w$$

$$\nabla f_2 = -m\gamma_w - E\gamma_t\gamma_w + p_x\gamma_x\gamma_w + p_y\gamma_y\gamma_w + p_z\gamma_z\gamma_w$$

$$\nabla f_3 = -m\gamma_w - E\gamma_t\gamma_w - p_x\gamma_x\gamma_w - p_y\gamma_y\gamma_w - p_z\gamma_z\gamma_w$$
$$\nabla f_4 = m\gamma_w - E\gamma_t\gamma_w + p_x\gamma_x\gamma_w + p_y\gamma_y\gamma_w + p_z\gamma_z\gamma_w$$

Square of the gradient

$$\nabla f_1^2 = -m^2 - {p_z}^2 + E^2 - {p_y}^2 - {p_x}^2$$
$$\nabla f_2^2 = -m^2 - {p_z}^2 + E^2 - {p_y}^2 - {p_x}^2$$
$$\nabla f_3^2 = -m^2 - {p_z}^2 + E^2 - {p_y}^2 - {p_x}^2$$
$$\nabla f_4^2 = -m^2 - {p_z}^2 + E^2 - {p_y}^2 - {p_x}^2$$

Dirac

$$http://en.wikipedia.org/wiki/Dirac\_equation$$
$$0 = (\gamma_0\frac{\partial}{\partial t} + \gamma_1\frac{\partial}{\partial x} + \gamma_2\frac{\partial}{\partial y} + \gamma_3\frac{\partial}{\partial z} + im)\psi$$

With the above gradients, identify the Dirac algebra aka gamma matrices

$$\gamma_0 = \gamma_t\gamma_w$$
$$-i\mathbf{i} = \gamma_t\gamma_w$$
$$\gamma_0^2 = 1$$
$$\gamma_1 = -\gamma_x\gamma_w$$
$$-i\boldsymbol{i}\mathbf{k} = -\gamma_x\gamma_w$$
$$\gamma_1^2 = -1$$
$$\gamma_2 = -\gamma_y\gamma_w$$
$$-i\boldsymbol{j}\mathbf{k} = -\gamma_y\gamma_w$$
$$\gamma_2^2 = -1$$
$$\gamma_3 = -\gamma_z\gamma_w$$
$$-i\boldsymbol{k}\mathbf{k} = -\gamma_z\gamma_w$$
$$\gamma_3^2 = -1$$
$$\gamma_5 = -\gamma_t\gamma_x\gamma_y\gamma_z\gamma_w$$
$$-i\mathbf{j} = -\gamma_t\gamma_x\gamma_y\gamma_z\gamma_w$$
$$\gamma_5^2 = 1$$

Substitution in Dirac equation

$$0 = (-i\mathbf{i}\frac{\partial}{\partial t} - i\boldsymbol{i}\mathbf{k}\frac{\partial}{\partial x} - i\boldsymbol{j}\mathbf{k}\frac{\partial}{\partial y} - i\boldsymbol{k}\mathbf{k}\frac{\partial}{\partial z} + im)\psi$$

Factorization and multiplication

$$0 = \mathbf{j}i(\mathbf{k}\frac{\partial}{\partial t} + \boldsymbol{i}\mathbf{i}\frac{\partial}{\partial x} + \boldsymbol{j}\mathbf{i}\frac{\partial}{\partial y} + \boldsymbol{k}\mathbf{i}\frac{\partial}{\partial z} - \mathbf{j}m)\psi$$

Simple Constants K (exactly the gradient)

$$K_1 = \mathbf{j}i(\mathbf{k}E - \mathbf{j}m + \mathbf{i}\mathbf{p})$$

$$K_2 = \mathbf{j}i(\mathbf{k}E + \mathbf{j}m - \mathbf{i}\mathbf{p})$$

$$K_3 = \mathbf{j}i(\mathbf{k}E + \mathbf{j}m + \mathbf{i}\mathbf{p})$$

$$K_4 = \mathbf{j}i(\mathbf{k}E - \mathbf{j}m - \mathbf{i}\mathbf{p})$$

Mixed Constants A (built from simple constants and the coquaternions)

L_1

$$\begin{pmatrix} L_1^1 \\ L_1^2 \\ L_1^3 \\ L_1^4 \end{pmatrix} \equiv \begin{pmatrix} K_1 + K_4\mathbf{i} - K_3\mathbf{j} - K_2\mathbf{k} \\ K_1 + K_4\mathbf{i} + K_3\mathbf{j} + K_2\mathbf{k} \\ K_1 - K_4\mathbf{i} + K_3\mathbf{j} - K_2\mathbf{k} \\ K_1 - K_4\mathbf{i} - K_3\mathbf{j} + K_2\mathbf{k} \end{pmatrix} - \begin{pmatrix} (1 - \mathbf{i} + \mathbf{j} - \mathbf{k})K_1 \\ (1 - \mathbf{i} - \mathbf{j} + \mathbf{k})K_1 \\ (1 + \mathbf{i} - \mathbf{j} - \mathbf{k})K_1 \\ (1 + \mathbf{i} + \mathbf{j} + \mathbf{k})K_1 \end{pmatrix} = \begin{pmatrix} 0 \\ 0 \\ 0 \\ 0 \end{pmatrix}$$

L_2

$$\begin{pmatrix} L_2^1 \\ L_2^2 \\ L_2^3 \\ L_2^4 \end{pmatrix} \equiv \begin{pmatrix} K_2 + K_3\mathbf{i} - K_4\mathbf{j} - K_1\mathbf{k} \\ K_2 + K_3\mathbf{i} + K_4\mathbf{j} + K_1\mathbf{k} \\ K_2 - K_3\mathbf{i} + K_4\mathbf{j} - K_1\mathbf{k} \\ K_2 - K_3\mathbf{i} - K_4\mathbf{j} + K_1\mathbf{k} \end{pmatrix} - \begin{pmatrix} (1 - \mathbf{i} + \mathbf{j} - \mathbf{k})K_2 \\ (1 - \mathbf{i} - \mathbf{j} + \mathbf{k})K_2 \\ (1 + \mathbf{i} - \mathbf{j} - \mathbf{k})K_2 \\ (1 + \mathbf{i} + \mathbf{j} + \mathbf{k})K_2 \end{pmatrix} = \begin{pmatrix} 0 \\ 0 \\ 0 \\ 0 \end{pmatrix}$$

L_3

$$\begin{pmatrix} L_3^1 \\ L_3^2 \\ L_3^3 \\ L_3^4 \end{pmatrix} \equiv \begin{pmatrix} K_3 + K_2\mathbf{i} - K_1\mathbf{j} - K_4\mathbf{k} \\ K_3 + K_2\mathbf{i} + K_1\mathbf{j} + K_4\mathbf{k} \\ K_3 - K_2\mathbf{i} + K_1\mathbf{j} - K_4\mathbf{k} \\ K_3 - K_2\mathbf{i} - K_1\mathbf{j} + K_4\mathbf{k} \end{pmatrix} - \begin{pmatrix} (1 - \mathbf{i} + \mathbf{j} - \mathbf{k})K_3 \\ (1 - \mathbf{i} - \mathbf{j} + \mathbf{k})K_3 \\ (1 + \mathbf{i} - \mathbf{j} - \mathbf{k})K_3 \\ (1 + \mathbf{i} + \mathbf{j} + \mathbf{k})K_3 \end{pmatrix} = \begin{pmatrix} 0 \\ 0 \\ 0 \\ 0 \end{pmatrix}$$

L_4

$$\begin{pmatrix} L_4^1 \\ L_4^2 \\ L_4^3 \\ L_4^4 \end{pmatrix} \equiv \begin{pmatrix} K_4 + K_1\mathbf{i} - K_2\mathbf{j} - K_3\mathbf{k} \\ K_4 + K_1\mathbf{i} + K_2\mathbf{j} + K_3\mathbf{k} \\ K_4 - K_1\mathbf{i} + K_2\mathbf{j} - K_3\mathbf{k} \\ K_4 - K_1\mathbf{i} - K_2\mathbf{j} + K_3\mathbf{k} \end{pmatrix} - \begin{pmatrix} (1 - \mathbf{i} + \mathbf{j} - \mathbf{k})K_4 \\ (1 - \mathbf{i} - \mathbf{j} + \mathbf{k})K_4 \\ (1 + \mathbf{i} - \mathbf{j} - \mathbf{k})K_4 \\ (1 + \mathbf{i} + \mathbf{j} + \mathbf{k})K_4 \end{pmatrix} = \begin{pmatrix} 0 \\ 0 \\ 0 \\ 0 \end{pmatrix}$$

R_1

$$\begin{pmatrix} R_1^1 \\ R_1^2 \\ R_1^3 \\ R_1^4 \end{pmatrix} \equiv \begin{pmatrix} K_1 + \mathbf{i}K_4 - \mathbf{j}K_3 - \mathbf{k}K_2 \\ K_1 + \mathbf{i}K_4 + \mathbf{j}K_3 + \mathbf{k}K_2 \\ K_1 - \mathbf{i}K_4 + \mathbf{j}K_3 - \mathbf{k}K_2 \\ K_1 - \mathbf{i}K_4 - \mathbf{j}K_3 + \mathbf{k}K_2 \end{pmatrix} - \begin{pmatrix} K_1(1 - \mathbf{i} + \mathbf{j} - \mathbf{k}) \\ K_1(1 - \mathbf{i} - \mathbf{j} + \mathbf{k}) \\ K_1(1 + \mathbf{i} - \mathbf{j} - \mathbf{k}) \\ K_1(1 + \mathbf{i} + \mathbf{j} + \mathbf{k}) \end{pmatrix} = \begin{pmatrix} 0 \\ 0 \\ 0 \\ 0 \end{pmatrix}$$

R_2

$$\begin{pmatrix} R_2^1 \\ R_2^2 \\ R_2^3 \\ R_2^4 \end{pmatrix} \equiv \begin{pmatrix} K_2 + \mathbf{i}K_3 - \mathbf{j}K_4 - \mathbf{k}K_1 \\ K_2 + \mathbf{i}K_3 + \mathbf{j}K_4 + \mathbf{k}K_1 \\ K_2 - \mathbf{i}K_3 + \mathbf{j}K_4 - \mathbf{k}K_1 \\ K_2 - \mathbf{i}K_3 - \mathbf{j}K_4 + \mathbf{k}K_1 \end{pmatrix} - \begin{pmatrix} K_2(1 - \mathbf{i} + \mathbf{j} - \mathbf{k}) \\ K_2(1 - \mathbf{i} - \mathbf{j} + \mathbf{k}) \\ K_2(1 + \mathbf{i} - \mathbf{j} - \mathbf{k}) \\ K_2(1 + \mathbf{i} + \mathbf{j} + \mathbf{k}) \end{pmatrix} = \begin{pmatrix} 0 \\ 0 \\ 0 \\ 0 \end{pmatrix}$$

R_3

$$\begin{pmatrix} R_3^1 \\ R_3^2 \\ R_3^3 \\ R_3^4 \end{pmatrix} \equiv \begin{pmatrix} K_3 + \mathbf{i}K_2 - \mathbf{j}K_1 - \mathbf{k}K_4 \\ K_3 + \mathbf{i}K_2 + \mathbf{j}K_1 + \mathbf{k}K_4 \\ K_3 - \mathbf{i}K_2 + \mathbf{j}K_1 - \mathbf{k}K_4 \\ K_3 - \mathbf{i}K_2 - \mathbf{j}K_1 + \mathbf{k}K_4 \end{pmatrix} - \begin{pmatrix} K_3(1 - \mathbf{i} + \mathbf{j} - \mathbf{k}) \\ K_3(1 - \mathbf{i} - \mathbf{j} + \mathbf{k}) \\ K_3(1 + \mathbf{i} - \mathbf{j} - \mathbf{k}) \\ K_3(1 + \mathbf{i} + \mathbf{j} + \mathbf{k}) \end{pmatrix} = \begin{pmatrix} 0 \\ 0 \\ 0 \\ 0 \end{pmatrix}$$

R_4

$$\begin{pmatrix} R_4^1 \\ R_4^2 \\ R_4^3 \\ R_4^4 \end{pmatrix} \equiv \begin{pmatrix} K_4 + \mathbf{i}K_1 - \mathbf{j}K_2 - \mathbf{k}K_3 \\ K_4 + \mathbf{i}K_1 + \mathbf{j}K_2 + \mathbf{k}K_3 \\ K_4 - \mathbf{i}K_1 + \mathbf{j}K_2 - \mathbf{k}K_3 \\ K_4 - \mathbf{i}K_1 - \mathbf{j}K_2 + \mathbf{k}K_3 \end{pmatrix} - \begin{pmatrix} K_4(1 - \mathbf{i} + \mathbf{j} - \mathbf{k}) \\ K_4(1 - \mathbf{i} - \mathbf{j} + \mathbf{k}) \\ K_4(1 + \mathbf{i} - \mathbf{j} - \mathbf{k}) \\ K_4(1 + \mathbf{i} + \mathbf{j} + \mathbf{k}) \end{pmatrix} = \begin{pmatrix} 0 \\ 0 \\ 0 \\ 0 \end{pmatrix}$$

$L_i^j K_i = 0$
$K_i R_i^j = 0$
$L_i^j R_i^j = 0$

Details about full solutions (built from mixed constants and the imaginary unit)
ψ_{L1}

$$\psi_{L1}^{1} \equiv (L_1^1 + iL_1^1) = K_1 + K_4\mathbf{i} - K_3\mathbf{j} - K_2\mathbf{k} + i(K_1 + K_4\mathbf{i} - K_3\mathbf{j} - K_2\mathbf{k})$$
$$\psi_{L1}^{1}K_1 = 0$$
$$\psi_{L1}^{2} \equiv (L_1^1 - iL_1^1) = K_1 + K_4\mathbf{i} - K_3\mathbf{j} - K_2\mathbf{k} - i(K_1 + K_4\mathbf{i} - K_3\mathbf{j} - K_2\mathbf{k})$$
$$\psi_{L1}^{2}K_1 = 0$$
$$\psi_{L1}^{3} \equiv (L_1^1 + iL_1^2) = K_1 + K_4\mathbf{i} - K_3\mathbf{j} - K_2\mathbf{k} + i(K_1 + K_4\mathbf{i} + K_3\mathbf{j} + K_2\mathbf{k})$$
$$\psi_{L1}^{3}K_1 = 0$$
$$\psi_{L1}^{4} \equiv (L_1^1 - iL_1^2) = K_1 + K_4\mathbf{i} - K_3\mathbf{j} - K_2\mathbf{k} - i(K_1 + K_4\mathbf{i} + K_3\mathbf{j} + K_2\mathbf{k})$$
$$\psi_{L1}^{4}K_1 = 0$$
$$\psi_{L1}^{5} \equiv (L_1^1 + iL_1^3) = K_1 + K_4\mathbf{i} - K_3\mathbf{j} - K_2\mathbf{k} + i(K_1 - K_4\mathbf{i} + K_3\mathbf{j} - K_2\mathbf{k})$$
$$\psi_{L1}^{5}K_1 = 0$$
$$\psi_{L1}^{6} \equiv (L_1^1 - iL_1^3) = K_1 + K_4\mathbf{i} - K_3\mathbf{j} - K_2\mathbf{k} - i(K_1 - K_4\mathbf{i} + K_3\mathbf{j} - K_2\mathbf{k})$$
$$\psi_{L1}^{6}K_1 = 0$$
$$\psi_{L1}^{7} \equiv (L_1^1 + iL_1^4) = K_1 + K_4\mathbf{i} - K_3\mathbf{j} - K_2\mathbf{k} + i(K_1 - K_4\mathbf{i} - K_3\mathbf{j} + K_2\mathbf{k})$$
$$\psi_{L1}^{7}K_1 = 0$$
$$\psi_{L1}^{8} \equiv (L_1^1 - iL_1^4) = K_1 + K_4\mathbf{i} - K_3\mathbf{j} - K_2\mathbf{k} - i(K_1 - K_4\mathbf{i} - K_3\mathbf{j} + K_2\mathbf{k})$$
$$\psi_{L1}^{8}K_1 = 0$$
$$\psi_{L1}^{9} \equiv (L_1^2 + iL_1^1) = K_1 + K_4\mathbf{i} + K_3\mathbf{j} + K_2\mathbf{k} + i(K_1 + K_4\mathbf{i} - K_3\mathbf{j} - K_2\mathbf{k})$$
$$\psi_{L1}^{9}K_1 = 0$$
$$\psi_{L1}^{10} \equiv (L_1^2 - iL_1^1) = K_1 + K_4\mathbf{i} + K_3\mathbf{j} + K_2\mathbf{k} - i(K_1 + K_4\mathbf{i} - K_3\mathbf{j} - K_2\mathbf{k})$$
$$\psi_{L1}^{10}K_1 = 0$$
$$\psi_{L1}^{11} \equiv (L_1^2 + iL_1^2) = K_1 + K_4\mathbf{i} + K_3\mathbf{j} + K_2\mathbf{k} + i(K_1 + K_4\mathbf{i} + K_3\mathbf{j} + K_2\mathbf{k})$$
$$\psi_{L1}^{11}K_1 = 0$$
$$\psi_{L1}^{12} \equiv (L_1^2 - iL_1^2) = K_1 + K_4\mathbf{i} + K_3\mathbf{j} + K_2\mathbf{k} - i(K_1 + K_4\mathbf{i} + K_3\mathbf{j} + K_2\mathbf{k})$$
$$\psi_{L1}^{12}K_1 = 0$$
$$\psi_{L1}^{13} \equiv (L_1^2 + iL_1^3) = K_1 + K_4\mathbf{i} + K_3\mathbf{j} + K_2\mathbf{k} + i(K_1 - K_4\mathbf{i} + K_3\mathbf{j} - K_2\mathbf{k})$$
$$\psi_{L1}^{13}K_1 = 0$$
$$\psi_{L1}^{14} \equiv (L_1^2 - iL_1^3) = K_1 + K_4\mathbf{i} + K_3\mathbf{j} + K_2\mathbf{k} - i(K_1 - K_4\mathbf{i} + K_3\mathbf{j} - K_2\mathbf{k})$$

$$\psi_{L1}^{14} K_1 = 0$$
$$\psi_{L1}^{15} \equiv (L_1^2 + iL_1^4) = K_1 + K_4\mathbf{i} + K_3\mathbf{j} + K_2\mathbf{k} + i(K_1 - K_4\mathbf{i} - K_3\mathbf{j} + K_2\mathbf{k})$$
$$\psi_{L1}^{15} K_1 = 0$$
$$\psi_{L1}^{16} \equiv (L_1^2 - iL_1^4) = K_1 + K_4\mathbf{i} + K_3\mathbf{j} + K_2\mathbf{k} - i(K_1 - K_4\mathbf{i} - K_3\mathbf{j} + K_2\mathbf{k})$$
$$\psi_{L1}^{16} K_1 = 0$$
$$\psi_{L1}^{17} \equiv (L_1^3 + iL_1^1) = K_1 - K_4\mathbf{i} + K_3\mathbf{j} - K_2\mathbf{k} + i(K_1 + K_4\mathbf{i} - K_3\mathbf{j} - K_2\mathbf{k})$$
$$\psi_{L1}^{17} K_1 = 0$$
$$\psi_{L1}^{18} \equiv (L_1^3 - iL_1^1) = K_1 - K_4\mathbf{i} + K_3\mathbf{j} - K_2\mathbf{k} - i(K_1 + K_4\mathbf{i} - K_3\mathbf{j} - K_2\mathbf{k})$$
$$\psi_{L1}^{18} K_1 = 0$$
$$\psi_{L1}^{19} \equiv (L_1^3 + iL_1^2) = K_1 - K_4\mathbf{i} + K_3\mathbf{j} - K_2\mathbf{k} + i(K_1 + K_4\mathbf{i} + K_3\mathbf{j} + K_2\mathbf{k})$$
$$\psi_{L1}^{19} K_1 = 0$$
$$\psi_{L1}^{20} \equiv (L_1^3 - iL_1^2) = K_1 - K_4\mathbf{i} + K_3\mathbf{j} - K_2\mathbf{k} - i(K_1 + K_4\mathbf{i} + K_3\mathbf{j} + K_2\mathbf{k})$$
$$\psi_{L1}^{20} K_1 = 0$$
$$\psi_{L1}^{21} \equiv (L_1^3 + iL_1^3) = K_1 - K_4\mathbf{i} + K_3\mathbf{j} - K_2\mathbf{k} + i(K_1 - K_4\mathbf{i} + K_3\mathbf{j} - K_2\mathbf{k})$$
$$\psi_{L1}^{21} K_1 = 0$$
$$\psi_{L1}^{22} \equiv (L_1^3 - iL_1^3) = K_1 - K_4\mathbf{i} + K_3\mathbf{j} - K_2\mathbf{k} - i(K_1 - K_4\mathbf{i} + K_3\mathbf{j} - K_2\mathbf{k})$$
$$\psi_{L1}^{22} K_1 = 0$$
$$\psi_{L1}^{23} \equiv (L_1^3 + iL_1^4) = K_1 - K_4\mathbf{i} + K_3\mathbf{j} - K_2\mathbf{k} + i(K_1 - K_4\mathbf{i} - K_3\mathbf{j} + K_2\mathbf{k})$$
$$\psi_{L1}^{23} K_1 = 0$$
$$\psi_{L1}^{24} \equiv (L_1^3 - iL_1^4) = K_1 - K_4\mathbf{i} + K_3\mathbf{j} - K_2\mathbf{k} - i(K_1 - K_4\mathbf{i} - K_3\mathbf{j} + K_2\mathbf{k})$$
$$\psi_{L1}^{24} K_1 = 0$$
$$\psi_{L1}^{25} \equiv (L_1^4 + iL_1^1) = K_1 - K_4\mathbf{i} - K_3\mathbf{j} + K_2\mathbf{k} + i(K_1 + K_4\mathbf{i} - K_3\mathbf{j} - K_2\mathbf{k})$$
$$\psi_{L1}^{25} K_1 = 0$$
$$\psi_{L1}^{26} \equiv (L_1^4 - iL_1^1) = K_1 - K_4\mathbf{i} - K_3\mathbf{j} + K_2\mathbf{k} - i(K_1 + K_4\mathbf{i} - K_3\mathbf{j} - K_2\mathbf{k})$$
$$\psi_{L1}^{26} K_1 = 0$$
$$\psi_{L1}^{27} \equiv (L_1^4 + iL_1^2) = K_1 - K_4\mathbf{i} - K_3\mathbf{j} + K_2\mathbf{k} + i(K_1 + K_4\mathbf{i} + K_3\mathbf{j} + K_2\mathbf{k})$$
$$\psi_{L1}^{27} K_1 = 0$$
$$\psi_{L1}^{28} \equiv (L_1^4 - iL_1^2) = K_1 - K_4\mathbf{i} - K_3\mathbf{j} + K_2\mathbf{k} - i(K_1 + K_4\mathbf{i} + K_3\mathbf{j} + K_2\mathbf{k})$$
$$\psi_{L1}^{28} K_1 = 0$$
$$\psi_{L1}^{29} \equiv (L_1^4 + iL_1^3) = K_1 - K_4\mathbf{i} - K_3\mathbf{j} + K_2\mathbf{k} + i(K_1 - K_4\mathbf{i} + K_3\mathbf{j} - K_2\mathbf{k})$$
$$\psi_{L1}^{29} K_1 = 0$$

$$\psi_{L1}^{30} \equiv (L_1^4 - iL_1^3) = K_1 - K_4\mathbf{i} - K_3\mathbf{j} + K_2\mathbf{k} - i(K_1 - K_4\mathbf{i} + K_3\mathbf{j} - K_2\mathbf{k})$$
$$\psi_{L1}^{30}K_1 = 0$$
$$\psi_{L1}^{31} \equiv (L_1^4 + iL_1^4) = K_1 - K_4\mathbf{i} - K_3\mathbf{j} + K_2\mathbf{k} + i(K_1 - K_4\mathbf{i} - K_3\mathbf{j} + K_2\mathbf{k})$$
$$\psi_{L1}^{31}K_1 = 0$$
$$\psi_{L1}^{32} \equiv (L_1^4 - iL_1^4) = K_1 - K_4\mathbf{i} - K_3\mathbf{j} + K_2\mathbf{k} - i(K_1 - K_4\mathbf{i} - K_3\mathbf{j} + K_2\mathbf{k})$$
$$\psi_{L1}^{32}K_1 = 0$$

ψ_{L2}

$$\psi_{L2}^{1} \equiv (L_2^1 + iL_2^1) = K_2 + K_3\mathbf{i} - K_4\mathbf{j} - K_1\mathbf{k} + i(K_2 + K_3\mathbf{i} - K_4\mathbf{j} - K_1\mathbf{k})$$
$$\psi_{L2}^{1}K_2 = 0$$
$$\psi_{L2}^{2} \equiv (L_2^1 - iL_2^1) = K_2 + K_3\mathbf{i} - K_4\mathbf{j} - K_1\mathbf{k} - i(K_2 + K_3\mathbf{i} - K_4\mathbf{j} - K_1\mathbf{k})$$
$$\psi_{L2}^{2}K_2 = 0$$
$$\psi_{L2}^{3} \equiv (L_2^1 + iL_2^2) = K_2 + K_3\mathbf{i} - K_4\mathbf{j} - K_1\mathbf{k} + i(K_2 + K_3\mathbf{i} + K_4\mathbf{j} + K_1\mathbf{k})$$
$$\psi_{L2}^{3}K_2 = 0$$
$$\psi_{L2}^{4} \equiv (L_2^1 - iL_2^2) = K_2 + K_3\mathbf{i} - K_4\mathbf{j} - K_1\mathbf{k} - i(K_2 + K_3\mathbf{i} + K_4\mathbf{j} + K_1\mathbf{k})$$
$$\psi_{L2}^{4}K_2 = 0$$
$$\psi_{L2}^{5} \equiv (L_2^1 + iL_2^3) = K_2 + K_3\mathbf{i} - K_4\mathbf{j} - K_1\mathbf{k} + i(K_2 - K_3\mathbf{i} + K_4\mathbf{j} - K_1\mathbf{k})$$
$$\psi_{L2}^{5}K_2 = 0$$
$$\psi_{L2}^{6} \equiv (L_2^1 - iL_2^3) = K_2 + K_3\mathbf{i} - K_4\mathbf{j} - K_1\mathbf{k} - i(K_2 - K_3\mathbf{i} + K_4\mathbf{j} - K_1\mathbf{k})$$
$$\psi_{L2}^{6}K_2 = 0$$
$$\psi_{L2}^{7} \equiv (L_2^1 + iL_2^4) = K_2 + K_3\mathbf{i} - K_4\mathbf{j} - K_1\mathbf{k} + i(K_2 - K_3\mathbf{i} - K_4\mathbf{j} + K_1\mathbf{k})$$
$$\psi_{L2}^{7}K_2 = 0$$
$$\psi_{L2}^{8} \equiv (L_2^1 - iL_2^4) = K_2 + K_3\mathbf{i} - K_4\mathbf{j} - K_1\mathbf{k} - i(K_2 - K_3\mathbf{i} - K_4\mathbf{j} + K_1\mathbf{k})$$
$$\psi_{L2}^{8}K_2 = 0$$
$$\psi_{L2}^{9} \equiv (L_2^2 + iL_2^1) = K_2 + K_3\mathbf{i} + K_4\mathbf{j} + K_1\mathbf{k} + i(K_2 + K_3\mathbf{i} - K_4\mathbf{j} - K_1\mathbf{k})$$
$$\psi_{L2}^{9}K_2 = 0$$
$$\psi_{L2}^{10} \equiv (L_2^2 - iL_2^1) = K_2 + K_3\mathbf{i} + K_4\mathbf{j} + K_1\mathbf{k} - i(K_2 + K_3\mathbf{i} - K_4\mathbf{j} - K_1\mathbf{k})$$
$$\psi_{L2}^{10}K_2 = 0$$
$$\psi_{L2}^{11} \equiv (L_2^2 + iL_2^2) = K_2 + K_3\mathbf{i} + K_4\mathbf{j} + K_1\mathbf{k} + i(K_2 + K_3\mathbf{i} + K_4\mathbf{j} + K_1\mathbf{k})$$
$$\psi_{L2}^{11}K_2 = 0$$
$$\psi_{L2}^{12} \equiv (L_2^2 - iL_2^2) = K_2 + K_3\mathbf{i} + K_4\mathbf{j} + K_1\mathbf{k} - i(K_2 + K_3\mathbf{i} + K_4\mathbf{j} + K_1\mathbf{k})$$
$$\psi_{L2}^{12}K_2 = 0$$

$$\psi_{L2}^{13} \equiv (L_2^2 + iL_2^3) = K_2 + K_3\mathbf{i} + K_4\mathbf{j} + K_1\mathbf{k} + i(K_2 - K_3\mathbf{i} + K_4\mathbf{j} - K_1\mathbf{k})$$
$$\psi_{L2}^{13} K_2 = 0$$
$$\psi_{L2}^{14} \equiv (L_2^2 - iL_2^3) = K_2 + K_3\mathbf{i} + K_4\mathbf{j} + K_1\mathbf{k} - i(K_2 - K_3\mathbf{i} + K_4\mathbf{j} - K_1\mathbf{k})$$
$$\psi_{L2}^{14} K_2 = 0$$
$$\psi_{L2}^{15} \equiv (L_2^2 + iL_2^4) = K_2 + K_3\mathbf{i} + K_4\mathbf{j} + K_1\mathbf{k} + i(K_2 - K_3\mathbf{i} - K_4\mathbf{j} + K_1\mathbf{k})$$
$$\psi_{L2}^{15} K_2 = 0$$
$$\psi_{L2}^{16} \equiv (L_2^2 - iL_2^4) = K_2 + K_3\mathbf{i} + K_4\mathbf{j} + K_1\mathbf{k} - i(K_2 - K_3\mathbf{i} - K_4\mathbf{j} + K_1\mathbf{k})$$
$$\psi_{L2}^{16} K_2 = 0$$
$$\psi_{L2}^{17} \equiv (L_2^3 + iL_2^1) = K_2 - K_3\mathbf{i} + K_4\mathbf{j} - K_1\mathbf{k} + i(K_2 + K_3\mathbf{i} - K_4\mathbf{j} - K_1\mathbf{k})$$
$$\psi_{L2}^{17} K_2 = 0$$
$$\psi_{L2}^{18} \equiv (L_2^3 - iL_2^1) = K_2 - K_3\mathbf{i} + K_4\mathbf{j} - K_1\mathbf{k} - i(K_2 + K_3\mathbf{i} - K_4\mathbf{j} - K_1\mathbf{k})$$
$$\psi_{L2}^{18} K_2 = 0$$
$$\psi_{L2}^{19} \equiv (L_2^3 + iL_2^2) = K_2 - K_3\mathbf{i} + K_4\mathbf{j} - K_1\mathbf{k} + i(K_2 + K_3\mathbf{i} + K_4\mathbf{j} + K_1\mathbf{k})$$
$$\psi_{L2}^{19} K_2 = 0$$
$$\psi_{L2}^{20} \equiv (L_2^3 - iL_2^2) = K_2 - K_3\mathbf{i} + K_4\mathbf{j} - K_1\mathbf{k} - i(K_2 + K_3\mathbf{i} + K_4\mathbf{j} + K_1\mathbf{k})$$
$$\psi_{L2}^{20} K_2 = 0$$
$$\psi_{L2}^{21} \equiv (L_2^3 + iL_2^3) = K_2 - K_3\mathbf{i} + K_4\mathbf{j} - K_1\mathbf{k} + i(K_2 - K_3\mathbf{i} + K_4\mathbf{j} - K_1\mathbf{k})$$
$$\psi_{L2}^{21} K_2 = 0$$
$$\psi_{L2}^{22} \equiv (L_2^3 - iL_2^3) = K_2 - K_3\mathbf{i} + K_4\mathbf{j} - K_1\mathbf{k} - i(K_2 - K_3\mathbf{i} + K_4\mathbf{j} - K_1\mathbf{k})$$
$$\psi_{L2}^{22} K_2 = 0$$
$$\psi_{L2}^{23} \equiv (L_2^3 + iL_2^4) = K_2 - K_3\mathbf{i} + K_4\mathbf{j} - K_1\mathbf{k} + i(K_2 - K_3\mathbf{i} - K_4\mathbf{j} + K_1\mathbf{k})$$
$$\psi_{L2}^{23} K_2 = 0$$
$$\psi_{L2}^{24} \equiv (L_2^3 - iL_2^4) = K_2 - K_3\mathbf{i} + K_4\mathbf{j} - K_1\mathbf{k} - i(K_2 - K_3\mathbf{i} - K_4\mathbf{j} + K_1\mathbf{k})$$
$$\psi_{L2}^{24} K_2 = 0$$
$$\psi_{L2}^{25} \equiv (L_2^4 + iL_2^1) = K_2 - K_3\mathbf{i} - K_4\mathbf{j} + K_1\mathbf{k} + i(K_2 + K_3\mathbf{i} - K_4\mathbf{j} - K_1\mathbf{k})$$
$$\psi_{L2}^{25} K_2 = 0$$
$$\psi_{L2}^{26} \equiv (L_2^4 - iL_2^1) = K_2 - K_3\mathbf{i} - K_4\mathbf{j} + K_1\mathbf{k} - i(K_2 + K_3\mathbf{i} - K_4\mathbf{j} - K_1\mathbf{k})$$
$$\psi_{L2}^{26} K_2 = 0$$
$$\psi_{L2}^{27} \equiv (L_2^4 + iL_2^2) = K_2 - K_3\mathbf{i} - K_4\mathbf{j} + K_1\mathbf{k} + i(K_2 + K_3\mathbf{i} + K_4\mathbf{j} + K_1\mathbf{k})$$
$$\psi_{L2}^{27} K_2 = 0$$
$$\psi_{L2}^{28} \equiv (L_2^4 - iL_2^2) = K_2 - K_3\mathbf{i} - K_4\mathbf{j} + K_1\mathbf{k} - i(K_2 + K_3\mathbf{i} + K_4\mathbf{j} + K_1\mathbf{k})$$

$$\psi_{L2}^{28}K_2 = 0$$
$$\psi_{L2}^{29} \equiv (L_2^4 + iL_2^3) = K_2 - K_3\mathbf{i} - K_4\mathbf{j} + K_1\mathbf{k} + i(K_2 - K_3\mathbf{i} + K_4\mathbf{j} - K_1\mathbf{k})$$
$$\psi_{L2}^{29}K_2 = 0$$
$$\psi_{L2}^{30} \equiv (L_2^4 - iL_2^3) = K_2 - K_3\mathbf{i} - K_4\mathbf{j} + K_1\mathbf{k} - i(K_2 - K_3\mathbf{i} + K_4\mathbf{j} - K_1\mathbf{k})$$
$$\psi_{L2}^{30}K_2 = 0$$
$$\psi_{L2}^{31} \equiv (L_2^4 + iL_2^4) = K_2 - K_3\mathbf{i} - K_4\mathbf{j} + K_1\mathbf{k} + i(K_2 - K_3\mathbf{i} - K_4\mathbf{j} + K_1\mathbf{k})$$
$$\psi_{L2}^{31}K_2 = 0$$
$$\psi_{L2}^{32} \equiv (L_2^4 - iL_2^4) = K_2 - K_3\mathbf{i} - K_4\mathbf{j} + K_1\mathbf{k} - i(K_2 - K_3\mathbf{i} - K_4\mathbf{j} + K_1\mathbf{k})$$
$$\psi_{L2}^{32}K_2 = 0$$

ψ_{L3}

$$\psi_{L3}^{1} \equiv (L_3^1 + iL_3^1) = K_3 + K_2\mathbf{i} - K_1\mathbf{j} - K_4\mathbf{k} + i(K_3 + K_2\mathbf{i} - K_1\mathbf{j} - K_4\mathbf{k})$$
$$\psi_{L3}^{1}K_3 = 0$$
$$\psi_{L3}^{2} \equiv (L_3^1 - iL_3^1) = K_3 + K_2\mathbf{i} - K_1\mathbf{j} - K_4\mathbf{k} - i(K_3 + K_2\mathbf{i} - K_1\mathbf{j} - K_4\mathbf{k})$$
$$\psi_{L3}^{2}K_3 = 0$$
$$\psi_{L3}^{3} \equiv (L_3^1 + iL_3^2) = K_3 + K_2\mathbf{i} - K_1\mathbf{j} - K_4\mathbf{k} + i(K_3 + K_2\mathbf{i} + K_1\mathbf{j} + K_4\mathbf{k})$$
$$\psi_{L3}^{3}K_3 = 0$$
$$\psi_{L3}^{4} \equiv (L_3^1 - iL_3^2) = K_3 + K_2\mathbf{i} - K_1\mathbf{j} - K_4\mathbf{k} - i(K_3 + K_2\mathbf{i} + K_1\mathbf{j} + K_4\mathbf{k})$$
$$\psi_{L3}^{4}K_3 = 0$$
$$\psi_{L3}^{5} \equiv (L_3^1 + iL_3^3) = K_3 + K_2\mathbf{i} - K_1\mathbf{j} - K_4\mathbf{k} + i(K_3 - K_2\mathbf{i} + K_1\mathbf{j} - K_4\mathbf{k})$$
$$\psi_{L3}^{5}K_3 = 0$$
$$\psi_{L3}^{6} \equiv (L_3^1 - iL_3^3) = K_3 + K_2\mathbf{i} - K_1\mathbf{j} - K_4\mathbf{k} - i(K_3 - K_2\mathbf{i} + K_1\mathbf{j} - K_4\mathbf{k})$$
$$\psi_{L3}^{6}K_3 = 0$$
$$\psi_{L3}^{7} \equiv (L_3^1 + iL_3^4) = K_3 + K_2\mathbf{i} - K_1\mathbf{j} - K_4\mathbf{k} + i(K_3 - K_2\mathbf{i} - K_1\mathbf{j} + K_4\mathbf{k})$$
$$\psi_{L3}^{7}K_3 = 0$$
$$\psi_{L3}^{8} \equiv (L_3^1 - iL_3^4) = K_3 + K_2\mathbf{i} - K_1\mathbf{j} - K_4\mathbf{k} - i(K_3 - K_2\mathbf{i} - K_1\mathbf{j} + K_4\mathbf{k})$$
$$\psi_{L3}^{8}K_3 = 0$$
$$\psi_{L3}^{9} \equiv (L_3^2 + iL_3^1) = K_3 + K_2\mathbf{i} + K_1\mathbf{j} + K_4\mathbf{k} + i(K_3 + K_2\mathbf{i} - K_1\mathbf{j} - K_4\mathbf{k})$$
$$\psi_{L3}^{9}K_3 = 0$$
$$\psi_{L3}^{10} \equiv (L_3^2 - iL_3^1) = K_3 + K_2\mathbf{i} + K_1\mathbf{j} + K_4\mathbf{k} - i(K_3 + K_2\mathbf{i} - K_1\mathbf{j} - K_4\mathbf{k})$$
$$\psi_{L3}^{10}K_3 = 0$$
$$\psi_{L3}^{11} \equiv (L_3^2 + iL_3^2) = K_3 + K_2\mathbf{i} + K_1\mathbf{j} + K_4\mathbf{k} + i(K_3 + K_2\mathbf{i} + K_1\mathbf{j} + K_4\mathbf{k})$$

$$\psi^{11}_{L3}K_3 = 0$$
$$\psi^{12}_{L3} \equiv (L^2_3 - iL^2_3) = K_3 + K_2\mathbf{i} + K_1\mathbf{j} + K_4\mathbf{k} - i(K_3 + K_2\mathbf{i} + K_1\mathbf{j} + K_4\mathbf{k})$$
$$\psi^{12}_{L3}K_3 = 0$$
$$\psi^{13}_{L3} \equiv (L^2_3 + iL^3_3) = K_3 + K_2\mathbf{i} + K_1\mathbf{j} + K_4\mathbf{k} + i(K_3 - K_2\mathbf{i} + K_1\mathbf{j} - K_4\mathbf{k})$$
$$\psi^{13}_{L3}K_3 = 0$$
$$\psi^{14}_{L3} \equiv (L^2_3 - iL^3_3) = K_3 + K_2\mathbf{i} + K_1\mathbf{j} + K_4\mathbf{k} - i(K_3 - K_2\mathbf{i} + K_1\mathbf{j} - K_4\mathbf{k})$$
$$\psi^{14}_{L3}K_3 = 0$$
$$\psi^{15}_{L3} \equiv (L^2_3 + iL^4_3) = K_3 + K_2\mathbf{i} + K_1\mathbf{j} + K_4\mathbf{k} + i(K_3 - K_2\mathbf{i} - K_1\mathbf{j} + K_4\mathbf{k})$$
$$\psi^{15}_{L3}K_3 = 0$$
$$\psi^{16}_{L3} \equiv (L^2_3 - iL^4_3) = K_3 + K_2\mathbf{i} + K_1\mathbf{j} + K_4\mathbf{k} - i(K_3 - K_2\mathbf{i} - K_1\mathbf{j} + K_4\mathbf{k})$$
$$\psi^{16}_{L3}K_3 = 0$$
$$\psi^{17}_{L3} \equiv (L^3_3 + iL^1_3) = K_3 - K_2\mathbf{i} + K_1\mathbf{j} - K_4\mathbf{k} + i(K_3 + K_2\mathbf{i} - K_1\mathbf{j} - K_4\mathbf{k})$$
$$\psi^{17}_{L3}K_3 = 0$$
$$\psi^{18}_{L3} \equiv (L^3_3 - iL^1_3) = K_3 - K_2\mathbf{i} + K_1\mathbf{j} - K_4\mathbf{k} - i(K_3 + K_2\mathbf{i} - K_1\mathbf{j} - K_4\mathbf{k})$$
$$\psi^{18}_{L3}K_3 = 0$$
$$\psi^{19}_{L3} \equiv (L^3_3 + iL^2_3) = K_3 - K_2\mathbf{i} + K_1\mathbf{j} - K_4\mathbf{k} + i(K_3 + K_2\mathbf{i} + K_1\mathbf{j} + K_4\mathbf{k})$$
$$\psi^{19}_{L3}K_3 = 0$$
$$\psi^{20}_{L3} \equiv (L^3_3 - iL^2_3) = K_3 - K_2\mathbf{i} + K_1\mathbf{j} - K_4\mathbf{k} - i(K_3 + K_2\mathbf{i} + K_1\mathbf{j} + K_4\mathbf{k})$$
$$\psi^{20}_{L3}K_3 = 0$$
$$\psi^{21}_{L3} \equiv (L^3_3 + iL^3_3) = K_3 - K_2\mathbf{i} + K_1\mathbf{j} - K_4\mathbf{k} + i(K_3 - K_2\mathbf{i} + K_1\mathbf{j} - K_4\mathbf{k})$$
$$\psi^{21}_{L3}K_3 = 0$$
$$\psi^{22}_{L3} \equiv (L^3_3 - iL^3_3) = K_3 - K_2\mathbf{i} + K_1\mathbf{j} - K_4\mathbf{k} - i(K_3 - K_2\mathbf{i} + K_1\mathbf{j} - K_4\mathbf{k})$$
$$\psi^{22}_{L3}K_3 = 0$$
$$\psi^{23}_{L3} \equiv (L^3_3 + iL^4_3) = K_3 - K_2\mathbf{i} + K_1\mathbf{j} - K_4\mathbf{k} + i(K_3 - K_2\mathbf{i} - K_1\mathbf{j} + K_4\mathbf{k})$$
$$\psi^{23}_{L3}K_3 = 0$$
$$\psi^{24}_{L3} \equiv (L^3_3 - iL^4_3) = K_3 - K_2\mathbf{i} + K_1\mathbf{j} - K_4\mathbf{k} - i(K_3 - K_2\mathbf{i} - K_1\mathbf{j} + K_4\mathbf{k})$$
$$\psi^{24}_{L3}K_3 = 0$$
$$\psi^{25}_{L3} \equiv (L^4_3 + iL^1_3) = K_3 - K_2\mathbf{i} - K_1\mathbf{j} + K_4\mathbf{k} + i(K_3 + K_2\mathbf{i} - K_1\mathbf{j} - K_4\mathbf{k})$$
$$\psi^{25}_{L3}K_3 = 0$$
$$\psi^{26}_{L3} \equiv (L^4_3 - iL^1_3) = K_3 - K_2\mathbf{i} - K_1\mathbf{j} + K_4\mathbf{k} - i(K_3 + K_2\mathbf{i} - K_1\mathbf{j} - K_4\mathbf{k})$$
$$\psi^{26}_{L3}K_3 = 0$$

$\psi_{L3}^{27} \equiv (L_3^4 + iL_3^2) = K_3 - K_2\mathbf{i} - K_1\mathbf{j} + K_4\mathbf{k} + i(K_3 + K_2\mathbf{i} + K_1\mathbf{j} + K_4\mathbf{k})$
$\psi_{L3}^{27} K_3 = 0$
$\psi_{L3}^{28} \equiv (L_3^4 - iL_3^2) = K_3 - K_2\mathbf{i} - K_1\mathbf{j} + K_4\mathbf{k} - i(K_3 + K_2\mathbf{i} + K_1\mathbf{j} + K_4\mathbf{k})$
$\psi_{L3}^{28} K_3 = 0$
$\psi_{L3}^{29} \equiv (L_3^4 + iL_3^3) = K_3 - K_2\mathbf{i} - K_1\mathbf{j} + K_4\mathbf{k} + i(K_3 - K_2\mathbf{i} + K_1\mathbf{j} - K_4\mathbf{k})$
$\psi_{L3}^{29} K_3 = 0$
$\psi_{L3}^{30} \equiv (L_3^4 - iL_3^3) = K_3 - K_2\mathbf{i} - K_1\mathbf{j} + K_4\mathbf{k} - i(K_3 - K_2\mathbf{i} + K_1\mathbf{j} - K_4\mathbf{k})$
$\psi_{L3}^{30} K_3 = 0$
$\psi_{L3}^{31} \equiv (L_3^4 + iL_3^4) = K_3 - K_2\mathbf{i} - K_1\mathbf{j} + K_4\mathbf{k} + i(K_3 - K_2\mathbf{i} - K_1\mathbf{j} + K_4\mathbf{k})$
$\psi_{L3}^{31} K_3 = 0$
$\psi_{L3}^{32} \equiv (L_3^4 - iL_3^4) = K_3 - K_2\mathbf{i} - K_1\mathbf{j} + K_4\mathbf{k} - i(K_3 - K_2\mathbf{i} - K_1\mathbf{j} + K_4\mathbf{k})$
$\psi_{L3}^{32} K_3 = 0$

ψ_{L4}

$\psi_{L4}^{1} \equiv (L_4^1 + iL_4^1) = K_4 + K_1\mathbf{i} - K_2\mathbf{j} - K_3\mathbf{k} + i(K_4 + K_1\mathbf{i} - K_2\mathbf{j} - K_3\mathbf{k})$
$\psi_{L4}^{1} K_4 = 0$
$\psi_{L4}^{2} \equiv (L_4^1 - iL_4^1) = K_4 + K_1\mathbf{i} - K_2\mathbf{j} - K_3\mathbf{k} - i(K_4 + K_1\mathbf{i} - K_2\mathbf{j} - K_3\mathbf{k})$
$\psi_{L4}^{2} K_4 = 0$
$\psi_{L4}^{3} \equiv (L_4^1 + iL_4^2) = K_4 + K_1\mathbf{i} - K_2\mathbf{j} - K_3\mathbf{k} + i(K_4 + K_1\mathbf{i} + K_2\mathbf{j} + K_3\mathbf{k})$
$\psi_{L4}^{3} K_4 = 0$
$\psi_{L4}^{4} \equiv (L_4^1 - iL_4^2) = K_4 + K_1\mathbf{i} - K_2\mathbf{j} - K_3\mathbf{k} - i(K_4 + K_1\mathbf{i} + K_2\mathbf{j} + K_3\mathbf{k})$
$\psi_{L4}^{4} K_4 = 0$
$\psi_{L4}^{5} \equiv (L_4^1 + iL_4^3) = K_4 + K_1\mathbf{i} - K_2\mathbf{j} - K_3\mathbf{k} + i(K_4 - K_1\mathbf{i} + K_2\mathbf{j} - K_3\mathbf{k})$
$\psi_{L4}^{5} K_4 = 0$
$\psi_{L4}^{6} \equiv (L_4^1 - iL_4^3) = K_4 + K_1\mathbf{i} - K_2\mathbf{j} - K_3\mathbf{k} - i(K_4 - K_1\mathbf{i} + K_2\mathbf{j} - K_3\mathbf{k})$
$\psi_{L4}^{6} K_4 = 0$
$\psi_{L4}^{7} \equiv (L_4^1 + iL_4^4) = K_4 + K_1\mathbf{i} - K_2\mathbf{j} - K_3\mathbf{k} + i(K_4 - K_1\mathbf{i} - K_2\mathbf{j} + K_3\mathbf{k})$
$\psi_{L4}^{7} K_4 = 0$
$\psi_{L4}^{8} \equiv (L_4^1 - iL_4^4) = K_4 + K_1\mathbf{i} - K_2\mathbf{j} - K_3\mathbf{k} - i(K_4 - K_1\mathbf{i} - K_2\mathbf{j} + K_3\mathbf{k})$
$\psi_{L4}^{8} K_4 = 0$
$\psi_{L4}^{9} \equiv (L_4^2 + iL_4^1) = K_4 + K_1\mathbf{i} + K_2\mathbf{j} + K_3\mathbf{k} + i(K_4 + K_1\mathbf{i} - K_2\mathbf{j} - K_3\mathbf{k})$
$\psi_{L4}^{9} K_4 = 0$

$$\psi^{10}_{L4} \equiv (L^2_4 - iL^1_4) = K_4 + K_1\mathbf{i} + K_2\mathbf{j} + K_3\mathbf{k} - i(K_4 + K_1\mathbf{i} - K_2\mathbf{j} - K_3\mathbf{k})$$
$$\psi^{10}_{L4} K_4 = 0$$
$$\psi^{11}_{L4} \equiv (L^2_4 + iL^2_4) = K_4 + K_1\mathbf{i} + K_2\mathbf{j} + K_3\mathbf{k} + i(K_4 + K_1\mathbf{i} + K_2\mathbf{j} + K_3\mathbf{k})$$
$$\psi^{11}_{L4} K_4 = 0$$
$$\psi^{12}_{L4} \equiv (L^2_4 - iL^2_4) = K_4 + K_1\mathbf{i} + K_2\mathbf{j} + K_3\mathbf{k} - i(K_4 + K_1\mathbf{i} + K_2\mathbf{j} + K_3\mathbf{k})$$
$$\psi^{12}_{L4} K_4 = 0$$
$$\psi^{13}_{L4} \equiv (L^2_4 + iL^3_4) = K_4 + K_1\mathbf{i} + K_2\mathbf{j} + K_3\mathbf{k} + i(K_4 - K_1\mathbf{i} + K_2\mathbf{j} - K_3\mathbf{k})$$
$$\psi^{13}_{L4} K_4 = 0$$
$$\psi^{14}_{L4} \equiv (L^2_4 - iL^3_4) = K_4 + K_1\mathbf{i} + K_2\mathbf{j} + K_3\mathbf{k} - i(K_4 - K_1\mathbf{i} + K_2\mathbf{j} - K_3\mathbf{k})$$
$$\psi^{14}_{L4} K_4 = 0$$
$$\psi^{15}_{L4} \equiv (L^2_4 + iL^4_4) = K_4 + K_1\mathbf{i} + K_2\mathbf{j} + K_3\mathbf{k} + i(K_4 - K_1\mathbf{i} - K_2\mathbf{j} + K_3\mathbf{k})$$
$$\psi^{15}_{L4} K_4 = 0$$
$$\psi^{16}_{L4} \equiv (L^2_4 - iL^4_4) = K_4 + K_1\mathbf{i} + K_2\mathbf{j} + K_3\mathbf{k} - i(K_4 - K_1\mathbf{i} - K_2\mathbf{j} + K_3\mathbf{k})$$
$$\psi^{16}_{L4} K_4 = 0$$
$$\psi^{17}_{L4} \equiv (L^3_4 + iL^1_4) = K_4 - K_1\mathbf{i} + K_2\mathbf{j} - K_3\mathbf{k} + i(K_4 + K_1\mathbf{i} - K_2\mathbf{j} - K_3\mathbf{k})$$
$$\psi^{17}_{L4} K_4 = 0$$
$$\psi^{18}_{L4} \equiv (L^3_4 - iL^1_4) = K_4 - K_1\mathbf{i} + K_2\mathbf{j} - K_3\mathbf{k} - i(K_4 + K_1\mathbf{i} - K_2\mathbf{j} - K_3\mathbf{k})$$
$$\psi^{18}_{L4} K_4 = 0$$
$$\psi^{19}_{L4} \equiv (L^3_4 + iL^2_4) = K_4 - K_1\mathbf{i} + K_2\mathbf{j} - K_3\mathbf{k} + i(K_4 + K_1\mathbf{i} + K_2\mathbf{j} + K_3\mathbf{k})$$
$$\psi^{19}_{L4} K_4 = 0$$
$$\psi^{20}_{L4} \equiv (L^3_4 - iL^2_4) = K_4 - K_1\mathbf{i} + K_2\mathbf{j} - K_3\mathbf{k} - i(K_4 + K_1\mathbf{i} + K_2\mathbf{j} + K_3\mathbf{k})$$
$$\psi^{20}_{L4} K_4 = 0$$
$$\psi^{21}_{L4} \equiv (L^3_4 + iL^3_4) = K_4 - K_1\mathbf{i} + K_2\mathbf{j} - K_3\mathbf{k} + i(K_4 - K_1\mathbf{i} + K_2\mathbf{j} - K_3\mathbf{k})$$
$$\psi^{21}_{L4} K_4 = 0$$
$$\psi^{22}_{L4} \equiv (L^3_4 - iL^3_4) = K_4 - K_1\mathbf{i} + K_2\mathbf{j} - K_3\mathbf{k} - i(K_4 - K_1\mathbf{i} + K_2\mathbf{j} - K_3\mathbf{k})$$
$$\psi^{22}_{L4} K_4 = 0$$
$$\psi^{23}_{L4} \equiv (L^3_4 + iL^4_4) = K_4 - K_1\mathbf{i} + K_2\mathbf{j} - K_3\mathbf{k} + i(K_4 - K_1\mathbf{i} - K_2\mathbf{j} + K_3\mathbf{k})$$
$$\psi^{23}_{L4} K_4 = 0$$
$$\psi^{24}_{L4} \equiv (L^3_4 - iL^4_4) = K_4 - K_1\mathbf{i} + K_2\mathbf{j} - K_3\mathbf{k} - i(K_4 - K_1\mathbf{i} - K_2\mathbf{j} + K_3\mathbf{k})$$
$$\psi^{24}_{L4} K_4 = 0$$
$$\psi^{25}_{L4} \equiv (L^4_4 + iL^1_4) = K_4 - K_1\mathbf{i} - K_2\mathbf{j} + K_3\mathbf{k} + i(K_4 + K_1\mathbf{i} - K_2\mathbf{j} - K_3\mathbf{k})$$

$$\psi_{L4}^{25}K_4 = 0$$
$$\psi_{L4}^{26} \equiv (L_4^4 - iL_4^1) = K_4 - K_1\mathbf{i} - K_2\mathbf{j} + K_3\mathbf{k} - i(K_4 + K_1\mathbf{i} - K_2\mathbf{j} - K_3\mathbf{k})$$
$$\psi_{L4}^{26}K_4 = 0$$
$$\psi_{L4}^{27} \equiv (L_4^4 + iL_4^2) = K_4 - K_1\mathbf{i} - K_2\mathbf{j} + K_3\mathbf{k} + i(K_4 + K_1\mathbf{i} + K_2\mathbf{j} + K_3\mathbf{k})$$
$$\psi_{L4}^{27}K_4 = 0$$
$$\psi_{L4}^{28} \equiv (L_4^4 - iL_4^2) = K_4 - K_1\mathbf{i} - K_2\mathbf{j} + K_3\mathbf{k} - i(K_4 + K_1\mathbf{i} + K_2\mathbf{j} + K_3\mathbf{k})$$
$$\psi_{L4}^{28}K_4 = 0$$
$$\psi_{L4}^{29} \equiv (L_4^4 + iL_4^3) = K_4 - K_1\mathbf{i} - K_2\mathbf{j} + K_3\mathbf{k} + i(K_4 - K_1\mathbf{i} + K_2\mathbf{j} - K_3\mathbf{k})$$
$$\psi_{L4}^{29}K_4 = 0$$
$$\psi_{L4}^{30} \equiv (L_4^4 - iL_4^3) = K_4 - K_1\mathbf{i} - K_2\mathbf{j} + K_3\mathbf{k} - i(K_4 - K_1\mathbf{i} + K_2\mathbf{j} - K_3\mathbf{k})$$
$$\psi_{L4}^{30}K_4 = 0$$
$$\psi_{L4}^{31} \equiv (L_4^4 + iL_4^4) = K_4 - K_1\mathbf{i} - K_2\mathbf{j} + K_3\mathbf{k} + i(K_4 - K_1\mathbf{i} - K_2\mathbf{j} + K_3\mathbf{k})$$
$$\psi_{L4}^{31}K_4 = 0$$
$$\psi_{L4}^{32} \equiv (L_4^4 - iL_4^4) = K_4 - K_1\mathbf{i} - K_2\mathbf{j} + K_3\mathbf{k} - i(K_4 - K_1\mathbf{i} - K_2\mathbf{j} + K_3\mathbf{k})$$
$$\psi_{L4}^{32}K_4 = 0$$

ψ_{R1}

$$\psi_{R1}^{1} \equiv (R_1^1 + R_1^1 i) = K_1 + \mathbf{i}K_4 - \mathbf{j}K_3 - \mathbf{k}K_2 + (K_1 + \mathbf{i}K_4 - \mathbf{j}K_3 - \mathbf{k}K_2)i$$
$$K_1\psi_{R1}^{1} = 0$$
$$\psi_{R1}^{2} \equiv (R_1^1 - R_1^1 i) = K_1 + \mathbf{i}K_4 - \mathbf{j}K_3 - \mathbf{k}K_2 - (K_1 + \mathbf{i}K_4 - \mathbf{j}K_3 - \mathbf{k}K_2)i$$
$$K_1\psi_{R1}^{2} = 0$$
$$\psi_{R1}^{3} \equiv (R_1^1 + R_1^2 i) = K_1 + \mathbf{i}K_4 - \mathbf{j}K_3 - \mathbf{k}K_2 + (K_1 + \mathbf{i}K_4 + \mathbf{j}K_3 + \mathbf{k}K_2)i$$
$$K_1\psi_{R1}^{3} = 0$$
$$\psi_{R1}^{4} \equiv (R_1^1 - R_1^2 i) = K_1 + \mathbf{i}K_4 - \mathbf{j}K_3 - \mathbf{k}K_2 - (K_1 + \mathbf{i}K_4 + \mathbf{j}K_3 + \mathbf{k}K_2)i$$
$$K_1\psi_{R1}^{4} = 0$$
$$\psi_{R1}^{5} \equiv (R_1^1 + R_1^3 i) = K_1 + \mathbf{i}K_4 - \mathbf{j}K_3 - \mathbf{k}K_2 + (K_1 - \mathbf{i}K_4 + \mathbf{j}K_3 - \mathbf{k}K_2)i$$
$$K_1\psi_{R1}^{5} = 0$$
$$\psi_{R1}^{6} \equiv (R_1^1 - R_1^3 i) = K_1 + \mathbf{i}K_4 - \mathbf{j}K_3 - \mathbf{k}K_2 - (K_1 - \mathbf{i}K_4 + \mathbf{j}K_3 - \mathbf{k}K_2)i$$
$$K_1\psi_{R1}^{6} = 0$$
$$\psi_{R1}^{7} \equiv (R_1^1 + R_1^4 i) = K_1 + \mathbf{i}K_4 - \mathbf{j}K_3 - \mathbf{k}K_2 + (K_1 - \mathbf{i}K_4 - \mathbf{j}K_3 + \mathbf{k}K_2)i$$
$$K_1\psi_{R1}^{7} = 0$$
$$\psi_{R1}^{8} \equiv (R_1^1 - R_1^4 i) = K_1 + \mathbf{i}K_4 - \mathbf{j}K_3 - \mathbf{k}K_2 - (K_1 - \mathbf{i}K_4 - \mathbf{j}K_3 + \mathbf{k}K_2)i$$
$$K_1\psi_{R1}^{8} = 0$$
$$\psi_{R1}^{9} \equiv (R_1^2 + R_1^1 i) = K_1 + \mathbf{i}K_4 + \mathbf{j}K_3 + \mathbf{k}K_2 + (K_1 + \mathbf{i}K_4 - \mathbf{j}K_3 - \mathbf{k}K_2)i$$
$$K_1\psi_{R1}^{9} = 0$$
$$\psi_{R1}^{10} \equiv (R_1^2 - R_1^1 i) = K_1 + \mathbf{i}K_4 + \mathbf{j}K_3 + \mathbf{k}K_2 - (K_1 + \mathbf{i}K_4 - \mathbf{j}K_3 - \mathbf{k}K_2)i$$
$$K_1\psi_{R1}^{10} = 0$$
$$\psi_{R1}^{11} \equiv (R_1^2 + R_1^2 i) = K_1 + \mathbf{i}K_4 + \mathbf{j}K_3 + \mathbf{k}K_2 + (K_1 + \mathbf{i}K_4 + \mathbf{j}K_3 + \mathbf{k}K_2)i$$
$$K_1\psi_{R1}^{11} = 0$$
$$\psi_{R1}^{12} \equiv (R_1^2 - R_1^2 i) = K_1 + \mathbf{i}K_4 + \mathbf{j}K_3 + \mathbf{k}K_2 - (K_1 + \mathbf{i}K_4 + \mathbf{j}K_3 + \mathbf{k}K_2)i$$
$$K_1\psi_{R1}^{12} = 0$$
$$\psi_{R1}^{13} \equiv (R_1^2 + R_1^3 i) = K_1 + \mathbf{i}K_4 + \mathbf{j}K_3 + \mathbf{k}K_2 + (K_1 - \mathbf{i}K_4 + \mathbf{j}K_3 - \mathbf{k}K_2)i$$
$$K_1\psi_{R1}^{13} = 0$$
$$\psi_{R1}^{14} \equiv (R_1^2 - R_1^3 i) = K_1 + \mathbf{i}K_4 + \mathbf{j}K_3 + \mathbf{k}K_2 - (K_1 - \mathbf{i}K_4 + \mathbf{j}K_3 - \mathbf{k}K_2)i$$

$$K_1\psi^{14}_{R1} = 0$$
$$\psi^{15}_{R1} \equiv (R^2_1 + R^4_1 i) = K_1 + \mathbf{i}K_4 + \mathbf{j}K_3 + \mathbf{k}K_2 + (K_1 - \mathbf{i}K_4 - \mathbf{j}K_3 + \mathbf{k}K_2)i$$
$$K_1\psi^{15}_{R1} = 0$$
$$\psi^{16}_{R1} \equiv (R^2_1 - R^4_1 i) = K_1 + \mathbf{i}K_4 + \mathbf{j}K_3 + \mathbf{k}K_2 - (K_1 - \mathbf{i}K_4 - \mathbf{j}K_3 + \mathbf{k}K_2)i$$
$$K_1\psi^{16}_{R1} = 0$$
$$\psi^{17}_{R1} \equiv (R^3_1 + R^1_1 i) = K_1 - \mathbf{i}K_4 + \mathbf{j}K_3 - \mathbf{k}K_2 + (K_1 + \mathbf{i}K_4 - \mathbf{j}K_3 - \mathbf{k}K_2)i$$
$$K_1\psi^{17}_{R1} = 0$$
$$\psi^{18}_{R1} \equiv (R^3_1 - R^1_1 i) = K_1 - \mathbf{i}K_4 + \mathbf{j}K_3 - \mathbf{k}K_2 - (K_1 + \mathbf{i}K_4 - \mathbf{j}K_3 - \mathbf{k}K_2)i$$
$$K_1\psi^{18}_{R1} = 0$$
$$\psi^{19}_{R1} \equiv (R^3_1 + R^2_1 i) = K_1 - \mathbf{i}K_4 + \mathbf{j}K_3 - \mathbf{k}K_2 + (K_1 + \mathbf{i}K_4 + \mathbf{j}K_3 + \mathbf{k}K_2)i$$
$$K_1\psi^{19}_{R1} = 0$$
$$\psi^{20}_{R1} \equiv (R^3_1 - R^2_1 i) = K_1 - \mathbf{i}K_4 + \mathbf{j}K_3 - \mathbf{k}K_2 - (K_1 + \mathbf{i}K_4 + \mathbf{j}K_3 + \mathbf{k}K_2)i$$
$$K_1\psi^{20}_{R1} = 0$$
$$\psi^{21}_{R1} \equiv (R^3_1 + R^3_1 i) = K_1 - \mathbf{i}K_4 + \mathbf{j}K_3 - \mathbf{k}K_2 + (K_1 - \mathbf{i}K_4 + \mathbf{j}K_3 - \mathbf{k}K_2)i$$
$$K_1\psi^{21}_{R1} = 0$$
$$\psi^{22}_{R1} \equiv (R^3_1 - R^3_1 i) = K_1 - \mathbf{i}K_4 + \mathbf{j}K_3 - \mathbf{k}K_2 - (K_1 - \mathbf{i}K_4 + \mathbf{j}K_3 - \mathbf{k}K_2)i$$
$$K_1\psi^{22}_{R1} = 0$$
$$\psi^{23}_{R1} \equiv (R^3_1 + R^4_1 i) = K_1 - \mathbf{i}K_4 + \mathbf{j}K_3 - \mathbf{k}K_2 + (K_1 - \mathbf{i}K_4 - \mathbf{j}K_3 + \mathbf{k}K_2)i$$
$$K_1\psi^{23}_{R1} = 0$$
$$\psi^{24}_{R1} \equiv (R^3_1 - R^4_1 i) = K_1 - \mathbf{i}K_4 + \mathbf{j}K_3 - \mathbf{k}K_2 - (K_1 - \mathbf{i}K_4 - \mathbf{j}K_3 + \mathbf{k}K_2)i$$
$$K_1\psi^{24}_{R1} = 0$$
$$\psi^{25}_{R1} \equiv (R^4_1 + R^1_1 i) = K_1 - \mathbf{i}K_4 - \mathbf{j}K_3 + \mathbf{k}K_2 + (K_1 + \mathbf{i}K_4 - \mathbf{j}K_3 - \mathbf{k}K_2)i$$
$$K_1\psi^{25}_{R1} = 0$$
$$\psi^{26}_{R1} \equiv (R^4_1 - R^1_1 i) = K_1 - \mathbf{i}K_4 - \mathbf{j}K_3 + \mathbf{k}K_2 - (K_1 + \mathbf{i}K_4 - \mathbf{j}K_3 - \mathbf{k}K_2)i$$
$$K_1\psi^{26}_{R1} = 0$$
$$\psi^{27}_{R1} \equiv (R^4_1 + R^2_1 i) = K_1 - \mathbf{i}K_4 - \mathbf{j}K_3 + \mathbf{k}K_2 + (K_1 + \mathbf{i}K_4 + \mathbf{j}K_3 + \mathbf{k}K_2)i$$
$$K_1\psi^{27}_{R1} = 0$$
$$\psi^{28}_{R1} \equiv (R^4_1 - R^2_1 i) = K_1 - \mathbf{i}K_4 - \mathbf{j}K_3 + \mathbf{k}K_2 - (K_1 + \mathbf{i}K_4 + \mathbf{j}K_3 + \mathbf{k}K_2)i$$
$$K_1\psi^{28}_{R1} = 0$$
$$\psi^{29}_{R1} \equiv (R^4_1 + R^3_1 i) = K_1 - \mathbf{i}K_4 - \mathbf{j}K_3 + \mathbf{k}K_2 + (K_1 - \mathbf{i}K_4 + \mathbf{j}K_3 - \mathbf{k}K_2)i$$
$$K_1\psi^{29}_{R1} = 0$$

$$\psi_{R1}^{30} \equiv (R_1^4 - R_1^3 i) = K_1 - \mathbf{i}K_4 - \mathbf{j}K_3 + \mathbf{k}K_2 - (K_1 - \mathbf{i}K_4 + \mathbf{j}K_3 - \mathbf{k}K_2)i$$
$$K_1\psi_{R1}^{30} = 0$$
$$\psi_{R1}^{31} \equiv (R_1^4 + R_1^4 i) = K_1 - \mathbf{i}K_4 - \mathbf{j}K_3 + \mathbf{k}K_2 + (K_1 - \mathbf{i}K_4 - \mathbf{j}K_3 + \mathbf{k}K_2)i$$
$$K_1\psi_{R1}^{31} = 0$$
$$\psi_{R1}^{32} \equiv (R_1^4 - R_1^4 i) = K_1 - \mathbf{i}K_4 - \mathbf{j}K_3 + \mathbf{k}K_2 - (K_1 - \mathbf{i}K_4 - \mathbf{j}K_3 + \mathbf{k}K_2)i$$
$$K_1\psi_{R1}^{32} = 0$$

ψ_{R2}

$$\psi_{R2}^{1} \equiv (R_2^1 + R_2^1 i) = K_2 + \mathbf{i}K_3 - \mathbf{j}K_4 - \mathbf{k}K_1 + (K_2 + \mathbf{i}K_3 - \mathbf{j}K_4 - \mathbf{k}K_1)i$$
$$K_2\psi_{R2}^{1} = 0$$
$$\psi_{R2}^{2} \equiv (R_2^1 - R_2^1 i) = K_2 + \mathbf{i}K_3 - \mathbf{j}K_4 - \mathbf{k}K_1 - (K_2 + \mathbf{i}K_3 - \mathbf{j}K_4 - \mathbf{k}K_1)i$$
$$K_2\psi_{R2}^{2} = 0$$
$$\psi_{R2}^{3} \equiv (R_2^1 + R_2^2 i) = K_2 + \mathbf{i}K_3 - \mathbf{j}K_4 - \mathbf{k}K_1 + (K_2 + \mathbf{i}K_3 + \mathbf{j}K_4 + \mathbf{k}K_1)i$$
$$K_2\psi_{R2}^{3} = 0$$
$$\psi_{R2}^{4} \equiv (R_2^1 - R_2^2 i) = K_2 + \mathbf{i}K_3 - \mathbf{j}K_4 - \mathbf{k}K_1 - (K_2 + \mathbf{i}K_3 + \mathbf{j}K_4 + \mathbf{k}K_1)i$$
$$K_2\psi_{R2}^{4} = 0$$
$$\psi_{R2}^{5} \equiv (R_2^1 + R_2^3 i) = K_2 + \mathbf{i}K_3 - \mathbf{j}K_4 - \mathbf{k}K_1 + (K_2 - \mathbf{i}K_3 + \mathbf{j}K_4 - \mathbf{k}K_1)i$$
$$K_2\psi_{R2}^{5} = 0$$
$$\psi_{R2}^{6} \equiv (R_2^1 - R_2^3 i) = K_2 + \mathbf{i}K_3 - \mathbf{j}K_4 - \mathbf{k}K_1 - (K_2 - \mathbf{i}K_3 + \mathbf{j}K_4 - \mathbf{k}K_1)i$$
$$K_2\psi_{R2}^{6} = 0$$
$$\psi_{R2}^{7} \equiv (R_2^1 + R_2^4 i) = K_2 + \mathbf{i}K_3 - \mathbf{j}K_4 - \mathbf{k}K_1 + (K_2 - \mathbf{i}K_3 - \mathbf{j}K_4 + \mathbf{k}K_1)i$$
$$K_2\psi_{R2}^{7} = 0$$
$$\psi_{R2}^{8} \equiv (R_2^1 - R_2^4 i) = K_2 + \mathbf{i}K_3 - \mathbf{j}K_4 - \mathbf{k}K_1 - (K_2 - \mathbf{i}K_3 - \mathbf{j}K_4 + \mathbf{k}K_1)i$$
$$K_2\psi_{R2}^{8} = 0$$
$$\psi_{R2}^{9} \equiv (R_2^2 + R_2^1 i) = K_2 + \mathbf{i}K_3 + \mathbf{j}K_4 + \mathbf{k}K_1 + (K_2 + \mathbf{i}K_3 - \mathbf{j}K_4 - \mathbf{k}K_1)i$$
$$K_2\psi_{R2}^{9} = 0$$
$$\psi_{R2}^{10} \equiv (R_2^2 - R_2^1 i) = K_2 + \mathbf{i}K_3 + \mathbf{j}K_4 + \mathbf{k}K_1 - (K_2 + \mathbf{i}K_3 - \mathbf{j}K_4 - \mathbf{k}K_1)i$$
$$K_2\psi_{R2}^{10} = 0$$
$$\psi_{R2}^{11} \equiv (R_2^2 + R_2^2 i) = K_2 + \mathbf{i}K_3 + \mathbf{j}K_4 + \mathbf{k}K_1 + (K_2 + \mathbf{i}K_3 + \mathbf{j}K_4 + \mathbf{k}K_1)i$$
$$K_2\psi_{R2}^{11} = 0$$
$$\psi_{R2}^{12} \equiv (R_2^2 - R_2^2 i) = K_2 + \mathbf{i}K_3 + \mathbf{j}K_4 + \mathbf{k}K_1 - (K_2 + \mathbf{i}K_3 + \mathbf{j}K_4 + \mathbf{k}K_1)i$$
$$K_2\psi_{R2}^{12} = 0$$

$$\psi_{R2}^{13} \equiv (R_2^2 + R_2^3 i) = K_2 + \mathbf{i}K_3 + \mathbf{j}K_4 + \mathbf{k}K_1 + (K_2 - \mathbf{i}K_3 + \mathbf{j}K_4 - \mathbf{k}K_1)i$$

$$K_2\psi_{R2}^{13} = 0$$

$$\psi_{R2}^{14} \equiv (R_2^2 - R_2^3 i) = K_2 + \mathbf{i}K_3 + \mathbf{j}K_4 + \mathbf{k}K_1 - (K_2 - \mathbf{i}K_3 + \mathbf{j}K_4 - \mathbf{k}K_1)i$$

$$K_2\psi_{R2}^{14} = 0$$

$$\psi_{R2}^{15} \equiv (R_2^2 + R_2^4 i) = K_2 + \mathbf{i}K_3 + \mathbf{j}K_4 + \mathbf{k}K_1 + (K_2 - \mathbf{i}K_3 - \mathbf{j}K_4 + \mathbf{k}K_1)i$$

$$K_2\psi_{R2}^{15} = 0$$

$$\psi_{R2}^{16} \equiv (R_2^2 - R_2^4 i) = K_2 + \mathbf{i}K_3 + \mathbf{j}K_4 + \mathbf{k}K_1 - (K_2 - \mathbf{i}K_3 - \mathbf{j}K_4 + \mathbf{k}K_1)i$$

$$K_2\psi_{R2}^{16} = 0$$

$$\psi_{R2}^{17} \equiv (R_2^3 + R_2^1 i) = K_2 - \mathbf{i}K_3 + \mathbf{j}K_4 - \mathbf{k}K_1 + (K_2 + \mathbf{i}K_3 - \mathbf{j}K_4 - \mathbf{k}K_1)i$$

$$K_2\psi_{R2}^{17} = 0$$

$$\psi_{R2}^{18} \equiv (R_2^3 - R_2^1 i) = K_2 - \mathbf{i}K_3 + \mathbf{j}K_4 - \mathbf{k}K_1 - (K_2 + \mathbf{i}K_3 - \mathbf{j}K_4 - \mathbf{k}K_1)i$$

$$K_2\psi_{R2}^{18} = 0$$

$$\psi_{R2}^{19} \equiv (R_2^3 + R_2^2 i) = K_2 - \mathbf{i}K_3 + \mathbf{j}K_4 - \mathbf{k}K_1 + (K_2 + \mathbf{i}K_3 + \mathbf{j}K_4 + \mathbf{k}K_1)i$$

$$K_2\psi_{R2}^{19} = 0$$

$$\psi_{R2}^{20} \equiv (R_2^3 - R_2^2 i) = K_2 - \mathbf{i}K_3 + \mathbf{j}K_4 - \mathbf{k}K_1 - (K_2 + \mathbf{i}K_3 + \mathbf{j}K_4 + \mathbf{k}K_1)i$$

$$K_2\psi_{R2}^{20} = 0$$

$$\psi_{R2}^{21} \equiv (R_2^3 + R_2^3 i) = K_2 - \mathbf{i}K_3 + \mathbf{j}K_4 - \mathbf{k}K_1 + (K_2 - \mathbf{i}K_3 + \mathbf{j}K_4 - \mathbf{k}K_1)i$$

$$K_2\psi_{R2}^{21} = 0$$

$$\psi_{R2}^{22} \equiv (R_2^3 - R_2^3 i) = K_2 - \mathbf{i}K_3 + \mathbf{j}K_4 - \mathbf{k}K_1 - (K_2 - \mathbf{i}K_3 + \mathbf{j}K_4 - \mathbf{k}K_1)i$$

$$K_2\psi_{R2}^{22} = 0$$

$$\psi_{R2}^{23} \equiv (R_2^3 + R_2^4 i) = K_2 - \mathbf{i}K_3 + \mathbf{j}K_4 - \mathbf{k}K_1 + (K_2 - \mathbf{i}K_3 - \mathbf{j}K_4 + \mathbf{k}K_1)i$$

$$K_2\psi_{R2}^{23} = 0$$

$$\psi_{R2}^{24} \equiv (R_2^3 - R_2^4 i) = K_2 - \mathbf{i}K_3 + \mathbf{j}K_4 - \mathbf{k}K_1 - (K_2 - \mathbf{i}K_3 - \mathbf{j}K_4 + \mathbf{k}K_1)i$$

$$K_2\psi_{R2}^{24} = 0$$

$$\psi_{R2}^{25} \equiv (R_2^4 + R_2^1 i) = K_2 - \mathbf{i}K_3 - \mathbf{j}K_4 + \mathbf{k}K_1 + (K_2 + \mathbf{i}K_3 - \mathbf{j}K_4 - \mathbf{k}K_1)i$$

$$K_2\psi_{R2}^{25} = 0$$

$$\psi_{R2}^{26} \equiv (R_2^4 - R_2^1 i) = K_2 - \mathbf{i}K_3 - \mathbf{j}K_4 + \mathbf{k}K_1 - (K_2 + \mathbf{i}K_3 - \mathbf{j}K_4 - \mathbf{k}K_1)i$$

$$K_2\psi_{R2}^{26} = 0$$

$$\psi_{R2}^{27} \equiv (R_2^4 + R_2^2 i) = K_2 - \mathbf{i}K_3 - \mathbf{j}K_4 + \mathbf{k}K_1 + (K_2 + \mathbf{i}K_3 + \mathbf{j}K_4 + \mathbf{k}K_1)i$$

$$K_2\psi_{R2}^{27} = 0$$

$$\psi_{R2}^{28} \equiv (R_2^4 - R_2^2 i) = K_2 - \mathbf{i}K_3 - \mathbf{j}K_4 + \mathbf{k}K_1 - (K_2 + \mathbf{i}K_3 + \mathbf{j}K_4 + \mathbf{k}K_1)i$$

$$K_2\psi_{R2}^{28}=0$$
$$\psi_{R2}^{29}\equiv(R_2^4+R_2^3i)=K_2-\mathbf{i}K_3-\mathbf{j}K_4+\mathbf{k}K_1+(K_2-\mathbf{i}K_3+\mathbf{j}K_4-\mathbf{k}K_1)i$$
$$K_2\psi_{R2}^{29}=0$$
$$\psi_{R2}^{30}\equiv(R_2^4-R_2^3i)=K_2-\mathbf{i}K_3-\mathbf{j}K_4+\mathbf{k}K_1-(K_2-\mathbf{i}K_3+\mathbf{j}K_4-\mathbf{k}K_1)i$$
$$K_2\psi_{R2}^{30}=0$$
$$\psi_{R2}^{31}\equiv(R_2^4+R_2^4i)=K_2-\mathbf{i}K_3-\mathbf{j}K_4+\mathbf{k}K_1+(K_2-\mathbf{i}K_3-\mathbf{j}K_4+\mathbf{k}K_1)i$$
$$K_2\psi_{R2}^{31}=0$$
$$\psi_{R2}^{32}\equiv(R_2^4-R_2^4i)=K_2-\mathbf{i}K_3-\mathbf{j}K_4+\mathbf{k}K_1-(K_2-\mathbf{i}K_3-\mathbf{j}K_4+\mathbf{k}K_1)i$$
$$K_2\psi_{R2}^{32}=0$$

ψ_{R3}

$$\psi_{R3}^{1}\equiv(R_3^1+R_3^1i)=K_3+\mathbf{i}K_2-\mathbf{j}K_1-\mathbf{k}K_4+(K_3+\mathbf{i}K_2-\mathbf{j}K_1-\mathbf{k}K_4)i$$
$$K_3\psi_{R3}^{1}=0$$
$$\psi_{R3}^{2}\equiv(R_3^1-R_3^1i)=K_3+\mathbf{i}K_2-\mathbf{j}K_1-\mathbf{k}K_4-(K_3+\mathbf{i}K_2-\mathbf{j}K_1-\mathbf{k}K_4)i$$
$$K_3\psi_{R3}^{2}=0$$
$$\psi_{R3}^{3}\equiv(R_3^1+R_3^2i)=K_3+\mathbf{i}K_2-\mathbf{j}K_1-\mathbf{k}K_4+(K_3+\mathbf{i}K_2+\mathbf{j}K_1+\mathbf{k}K_4)i$$
$$K_3\psi_{R3}^{3}=0$$
$$\psi_{R3}^{4}\equiv(R_3^1-R_3^2i)=K_3+\mathbf{i}K_2-\mathbf{j}K_1-\mathbf{k}K_4-(K_3+\mathbf{i}K_2+\mathbf{j}K_1+\mathbf{k}K_4)i$$
$$K_3\psi_{R3}^{4}=0$$
$$\psi_{R3}^{5}\equiv(R_3^1+R_3^3i)=K_3+\mathbf{i}K_2-\mathbf{j}K_1-\mathbf{k}K_4+(K_3-\mathbf{i}K_2+\mathbf{j}K_1-\mathbf{k}K_4)i$$
$$K_3\psi_{R3}^{5}=0$$
$$\psi_{R3}^{6}\equiv(R_3^1-R_3^3i)=K_3+\mathbf{i}K_2-\mathbf{j}K_1-\mathbf{k}K_4-(K_3-\mathbf{i}K_2+\mathbf{j}K_1-\mathbf{k}K_4)i$$
$$K_3\psi_{R3}^{6}=0$$
$$\psi_{R3}^{7}\equiv(R_3^1+R_3^4i)=K_3+\mathbf{i}K_2-\mathbf{j}K_1-\mathbf{k}K_4+(K_3-\mathbf{i}K_2-\mathbf{j}K_1+\mathbf{k}K_4)i$$
$$K_3\psi_{R3}^{7}=0$$
$$\psi_{R3}^{8}\equiv(R_3^1-R_3^4i)=K_3+\mathbf{i}K_2-\mathbf{j}K_1-\mathbf{k}K_4-(K_3-\mathbf{i}K_2-\mathbf{j}K_1+\mathbf{k}K_4)i$$
$$K_3\psi_{R3}^{8}=0$$
$$\psi_{R3}^{9}\equiv(R_3^2+R_3^1i)=K_3+\mathbf{i}K_2+\mathbf{j}K_1+\mathbf{k}K_4+(K_3+\mathbf{i}K_2-\mathbf{j}K_1-\mathbf{k}K_4)i$$
$$K_3\psi_{R3}^{9}=0$$
$$\psi_{R3}^{10}\equiv(R_3^2-R_3^1i)=K_3+\mathbf{i}K_2+\mathbf{j}K_1+\mathbf{k}K_4-(K_3+\mathbf{i}K_2-\mathbf{j}K_1-\mathbf{k}K_4)i$$
$$K_3\psi_{R3}^{10}=0$$
$$\psi_{R3}^{11}\equiv(R_3^2+R_3^2i)=K_3+\mathbf{i}K_2+\mathbf{j}K_1+\mathbf{k}K_4+(K_3+\mathbf{i}K_2+\mathbf{j}K_1+\mathbf{k}K_4)i$$

$$K_3\psi_{R3}^{11} = 0$$
$$\psi_{R3}^{12} \equiv (R_3^2 - R_3^2 i) = K_3 + \mathbf{i}K_2 + \mathbf{j}K_1 + \mathbf{k}K_4 - (K_3 + \mathbf{i}K_2 + \mathbf{j}K_1 + \mathbf{k}K_4)i$$
$$K_3\psi_{R3}^{12} = 0$$
$$\psi_{R3}^{13} \equiv (R_3^2 + R_3^3 i) = K_3 + \mathbf{i}K_2 + \mathbf{j}K_1 + \mathbf{k}K_4 + (K_3 - \mathbf{i}K_2 + \mathbf{j}K_1 - \mathbf{k}K_4)i$$
$$K_3\psi_{R3}^{13} = 0$$
$$\psi_{R3}^{14} \equiv (R_3^2 - R_3^3 i) = K_3 + \mathbf{i}K_2 + \mathbf{j}K_1 + \mathbf{k}K_4 - (K_3 - \mathbf{i}K_2 + \mathbf{j}K_1 - \mathbf{k}K_4)i$$
$$K_3\psi_{R3}^{14} = 0$$
$$\psi_{R3}^{15} \equiv (R_3^2 + R_3^4 i) = K_3 + \mathbf{i}K_2 + \mathbf{j}K_1 + \mathbf{k}K_4 + (K_3 - \mathbf{i}K_2 - \mathbf{j}K_1 + \mathbf{k}K_4)i$$
$$K_3\psi_{R3}^{15} = 0$$
$$\psi_{R3}^{16} \equiv (R_3^2 - R_3^4 i) = K_3 + \mathbf{i}K_2 + \mathbf{j}K_1 + \mathbf{k}K_4 - (K_3 - \mathbf{i}K_2 - \mathbf{j}K_1 + \mathbf{k}K_4)i$$
$$K_3\psi_{R3}^{16} = 0$$
$$\psi_{R3}^{17} \equiv (R_3^3 + R_3^1 i) = K_3 - \mathbf{i}K_2 + \mathbf{j}K_1 - \mathbf{k}K_4 + (K_3 + \mathbf{i}K_2 - \mathbf{j}K_1 - \mathbf{k}K_4)i$$
$$K_3\psi_{R3}^{17} = 0$$
$$\psi_{R3}^{18} \equiv (R_3^3 - R_3^1 i) = K_3 - \mathbf{i}K_2 + \mathbf{j}K_1 - \mathbf{k}K_4 - (K_3 + \mathbf{i}K_2 - \mathbf{j}K_1 - \mathbf{k}K_4)i$$
$$K_3\psi_{R3}^{18} = 0$$
$$\psi_{R3}^{19} \equiv (R_3^3 + R_3^2 i) = K_3 - \mathbf{i}K_2 + \mathbf{j}K_1 - \mathbf{k}K_4 + (K_3 + \mathbf{i}K_2 + \mathbf{j}K_1 + \mathbf{k}K_4)i$$
$$K_3\psi_{R3}^{19} = 0$$
$$\psi_{R3}^{20} \equiv (R_3^3 - R_3^2 i) = K_3 - \mathbf{i}K_2 + \mathbf{j}K_1 - \mathbf{k}K_4 - (K_3 + \mathbf{i}K_2 + \mathbf{j}K_1 + \mathbf{k}K_4)i$$
$$K_3\psi_{R3}^{20} = 0$$
$$\psi_{R3}^{21} \equiv (R_3^3 + R_3^3 i) = K_3 - \mathbf{i}K_2 + \mathbf{j}K_1 - \mathbf{k}K_4 + (K_3 - \mathbf{i}K_2 + \mathbf{j}K_1 - \mathbf{k}K_4)i$$
$$K_3\psi_{R3}^{21} = 0$$
$$\psi_{R3}^{22} \equiv (R_3^3 - R_3^3 i) = K_3 - \mathbf{i}K_2 + \mathbf{j}K_1 - \mathbf{k}K_4 - (K_3 - \mathbf{i}K_2 + \mathbf{j}K_1 - \mathbf{k}K_4)i$$
$$K_3\psi_{R3}^{22} = 0$$
$$\psi_{R3}^{23} \equiv (R_3^3 + R_3^4 i) = K_3 - \mathbf{i}K_2 + \mathbf{j}K_1 - \mathbf{k}K_4 + (K_3 - \mathbf{i}K_2 - \mathbf{j}K_1 + \mathbf{k}K_4)i$$
$$K_3\psi_{R3}^{23} = 0$$
$$\psi_{R3}^{24} \equiv (R_3^3 - R_3^4 i) = K_3 - \mathbf{i}K_2 + \mathbf{j}K_1 - \mathbf{k}K_4 - (K_3 - \mathbf{i}K_2 - \mathbf{j}K_1 + \mathbf{k}K_4)i$$
$$K_3\psi_{R3}^{24} = 0$$
$$\psi_{R3}^{25} \equiv (R_3^4 + R_3^1 i) = K_3 - \mathbf{i}K_2 - \mathbf{j}K_1 + \mathbf{k}K_4 + (K_3 + \mathbf{i}K_2 - \mathbf{j}K_1 - \mathbf{k}K_4)i$$
$$K_3\psi_{R3}^{25} = 0$$
$$\psi_{R3}^{26} \equiv (R_3^4 - R_3^1 i) = K_3 - \mathbf{i}K_2 - \mathbf{j}K_1 + \mathbf{k}K_4 - (K_3 + \mathbf{i}K_2 - \mathbf{j}K_1 - \mathbf{k}K_4)i$$
$$K_3\psi_{R3}^{26} = 0$$

$$\psi^{27}_{R3} \equiv (R^4_3 + R^2_3 i) = K_3 - \mathbf{i}K_2 - \mathbf{j}K_1 + \mathbf{k}K_4 + (K_3 + \mathbf{i}K_2 + \mathbf{j}K_1 + \mathbf{k}K_4)i$$
$$K_3\psi^{27}_{R3} = 0$$
$$\psi^{28}_{R3} \equiv (R^4_3 - R^2_3 i) = K_3 - \mathbf{i}K_2 - \mathbf{j}K_1 + \mathbf{k}K_4 - (K_3 + \mathbf{i}K_2 + \mathbf{j}K_1 + \mathbf{k}K_4)i$$
$$K_3\psi^{28}_{R3} = 0$$
$$\psi^{29}_{R3} \equiv (R^4_3 + R^3_3 i) = K_3 - \mathbf{i}K_2 - \mathbf{j}K_1 + \mathbf{k}K_4 + (K_3 - \mathbf{i}K_2 + \mathbf{j}K_1 - \mathbf{k}K_4)i$$
$$K_3\psi^{29}_{R3} = 0$$
$$\psi^{30}_{R3} \equiv (R^4_3 - R^3_3 i) = K_3 - \mathbf{i}K_2 - \mathbf{j}K_1 + \mathbf{k}K_4 - (K_3 - \mathbf{i}K_2 + \mathbf{j}K_1 - \mathbf{k}K_4)i$$
$$K_3\psi^{30}_{R3} = 0$$
$$\psi^{31}_{R3} \equiv (R^4_3 + R^4_3 i) = K_3 - \mathbf{i}K_2 - \mathbf{j}K_1 + \mathbf{k}K_4 + (K_3 - \mathbf{i}K_2 - \mathbf{j}K_1 + \mathbf{k}K_4)i$$
$$K_3\psi^{31}_{R3} = 0$$
$$\psi^{32}_{R3} \equiv (R^4_3 - R^4_3 i) = K_3 - \mathbf{i}K_2 - \mathbf{j}K_1 + \mathbf{k}K_4 - (K_3 - \mathbf{i}K_2 - \mathbf{j}K_1 + \mathbf{k}K_4)i$$
$$K_3\psi^{32}_{R3} = 0$$

ψ_{R4}

$$\psi^{1}_{R4} \equiv (R^1_4 + R^1_4 i) = K_4 + \mathbf{i}K_1 - \mathbf{j}K_2 - \mathbf{k}K_3 + (K_4 + \mathbf{i}K_1 - \mathbf{j}K_2 - \mathbf{k}K_3)i$$
$$K_4\psi^{1}_{R4} = 0$$
$$\psi^{2}_{R4} \equiv (R^1_4 - R^1_4 i) = K_4 + \mathbf{i}K_1 - \mathbf{j}K_2 - \mathbf{k}K_3 - (K_4 + \mathbf{i}K_1 - \mathbf{j}K_2 - \mathbf{k}K_3)i$$
$$K_4\psi^{2}_{R4} = 0$$
$$\psi^{3}_{R4} \equiv (R^1_4 + R^2_4 i) = K_4 + \mathbf{i}K_1 - \mathbf{j}K_2 - \mathbf{k}K_3 + (K_4 + \mathbf{i}K_1 + \mathbf{j}K_2 + \mathbf{k}K_3)i$$
$$K_4\psi^{3}_{R4} = 0$$
$$\psi^{4}_{R4} \equiv (R^1_4 - R^2_4 i) = K_4 + \mathbf{i}K_1 - \mathbf{j}K_2 - \mathbf{k}K_3 - (K_4 + \mathbf{i}K_1 + \mathbf{j}K_2 + \mathbf{k}K_3)i$$
$$K_4\psi^{4}_{R4} = 0$$
$$\psi^{5}_{R4} \equiv (R^1_4 + R^3_4 i) = K_4 + \mathbf{i}K_1 - \mathbf{j}K_2 - \mathbf{k}K_3 + (K_4 - \mathbf{i}K_1 + \mathbf{j}K_2 - \mathbf{k}K_3)i$$
$$K_4\psi^{5}_{R4} = 0$$
$$\psi^{6}_{R4} \equiv (R^1_4 - R^3_4 i) = K_4 + \mathbf{i}K_1 - \mathbf{j}K_2 - \mathbf{k}K_3 - (K_4 - \mathbf{i}K_1 + \mathbf{j}K_2 - \mathbf{k}K_3)i$$
$$K_4\psi^{6}_{R4} = 0$$
$$\psi^{7}_{R4} \equiv (R^1_4 + R^4_4 i) = K_4 + \mathbf{i}K_1 - \mathbf{j}K_2 - \mathbf{k}K_3 + (K_4 - \mathbf{i}K_1 - \mathbf{j}K_2 + \mathbf{k}K_3)i$$
$$K_4\psi^{7}_{R4} = 0$$
$$\psi^{8}_{R4} \equiv (R^1_4 - R^4_4 i) = K_4 + \mathbf{i}K_1 - \mathbf{j}K_2 - \mathbf{k}K_3 - (K_4 - \mathbf{i}K_1 - \mathbf{j}K_2 + \mathbf{k}K_3)i$$
$$K_4\psi^{8}_{R4} = 0$$
$$\psi^{9}_{R4} \equiv (R^2_4 + R^1_4 i) = K_4 + \mathbf{i}K_1 + \mathbf{j}K_2 + \mathbf{k}K_3 + (K_4 + \mathbf{i}K_1 - \mathbf{j}K_2 - \mathbf{k}K_3)i$$
$$K_4\psi^{9}_{R4} = 0$$

$$\psi_{R4}^{10} \equiv (R_4^2 - R_4^1 i) = K_4 + \mathbf{i}K_1 + \mathbf{j}K_2 + \mathbf{k}K_3 - (K_4 + \mathbf{i}K_1 - \mathbf{j}K_2 - \mathbf{k}K_3)i$$
$$K_4\psi_{R4}^{10} = 0$$
$$\psi_{R4}^{11} \equiv (R_4^2 + R_4^2 i) = K_4 + \mathbf{i}K_1 + \mathbf{j}K_2 + \mathbf{k}K_3 + (K_4 + \mathbf{i}K_1 + \mathbf{j}K_2 + \mathbf{k}K_3)i$$
$$K_4\psi_{R4}^{11} = 0$$
$$\psi_{R4}^{12} \equiv (R_4^2 - R_4^2 i) = K_4 + \mathbf{i}K_1 + \mathbf{j}K_2 + \mathbf{k}K_3 - (K_4 + \mathbf{i}K_1 + \mathbf{j}K_2 + \mathbf{k}K_3)i$$
$$K_4\psi_{R4}^{12} = 0$$
$$\psi_{R4}^{13} \equiv (R_4^2 + R_4^3 i) = K_4 + \mathbf{i}K_1 + \mathbf{j}K_2 + \mathbf{k}K_3 + (K_4 - \mathbf{i}K_1 + \mathbf{j}K_2 - \mathbf{k}K_3)i$$
$$K_4\psi_{R4}^{13} = 0$$
$$\psi_{R4}^{14} \equiv (R_4^2 - R_4^3 i) = K_4 + \mathbf{i}K_1 + \mathbf{j}K_2 + \mathbf{k}K_3 - (K_4 - \mathbf{i}K_1 + \mathbf{j}K_2 - \mathbf{k}K_3)i$$
$$K_4\psi_{R4}^{14} = 0$$
$$\psi_{R4}^{15} \equiv (R_4^2 + R_4^4 i) = K_4 + \mathbf{i}K_1 + \mathbf{j}K_2 + \mathbf{k}K_3 + (K_4 - \mathbf{i}K_1 - \mathbf{j}K_2 + \mathbf{k}K_3)i$$
$$K_4\psi_{R4}^{15} = 0$$
$$\psi_{R4}^{16} \equiv (R_4^2 - R_4^4 i) = K_4 + \mathbf{i}K_1 + \mathbf{j}K_2 + \mathbf{k}K_3 - (K_4 - \mathbf{i}K_1 - \mathbf{j}K_2 + \mathbf{k}K_3)i$$
$$K_4\psi_{R4}^{16} = 0$$
$$\psi_{R4}^{17} \equiv (R_4^3 + R_4^1 i) = K_4 - \mathbf{i}K_1 + \mathbf{j}K_2 - \mathbf{k}K_3 + (K_4 + \mathbf{i}K_1 - \mathbf{j}K_2 - \mathbf{k}K_3)i$$
$$K_4\psi_{R4}^{17} = 0$$
$$\psi_{R4}^{18} \equiv (R_4^3 - R_4^1 i) = K_4 - \mathbf{i}K_1 + \mathbf{j}K_2 - \mathbf{k}K_3 - (K_4 + \mathbf{i}K_1 - \mathbf{j}K_2 - \mathbf{k}K_3)i$$
$$K_4\psi_{R4}^{18} = 0$$
$$\psi_{R4}^{19} \equiv (R_4^3 + R_4^2 i) = K_4 - \mathbf{i}K_1 + \mathbf{j}K_2 - \mathbf{k}K_3 + (K_4 + \mathbf{i}K_1 + \mathbf{j}K_2 + \mathbf{k}K_3)i$$
$$K_4\psi_{R4}^{19} = 0$$
$$\psi_{R4}^{20} \equiv (R_4^3 - R_4^2 i) = K_4 - \mathbf{i}K_1 + \mathbf{j}K_2 - \mathbf{k}K_3 - (K_4 + \mathbf{i}K_1 + \mathbf{j}K_2 + \mathbf{k}K_3)i$$
$$K_4\psi_{R4}^{20} = 0$$
$$\psi_{R4}^{21} \equiv (R_4^3 + R_4^3 i) = K_4 - \mathbf{i}K_1 + \mathbf{j}K_2 - \mathbf{k}K_3 + (K_4 - \mathbf{i}K_1 + \mathbf{j}K_2 - \mathbf{k}K_3)i$$
$$K_4\psi_{R4}^{21} = 0$$
$$\psi_{R4}^{22} \equiv (R_4^3 - R_4^3 i) = K_4 - \mathbf{i}K_1 + \mathbf{j}K_2 - \mathbf{k}K_3 - (K_4 - \mathbf{i}K_1 + \mathbf{j}K_2 - \mathbf{k}K_3)i$$
$$K_4\psi_{R4}^{22} = 0$$
$$\psi_{R4}^{23} \equiv (R_4^3 + R_4^4 i) = K_4 - \mathbf{i}K_1 + \mathbf{j}K_2 - \mathbf{k}K_3 + (K_4 - \mathbf{i}K_1 - \mathbf{j}K_2 + \mathbf{k}K_3)i$$
$$K_4\psi_{R4}^{23} = 0$$
$$\psi_{R4}^{24} \equiv (R_4^3 - R_4^4 i) = K_4 - \mathbf{i}K_1 + \mathbf{j}K_2 - \mathbf{k}K_3 - (K_4 - \mathbf{i}K_1 - \mathbf{j}K_2 + \mathbf{k}K_3)i$$
$$K_4\psi_{R4}^{24} = 0$$
$$\psi_{R4}^{25} \equiv (R_4^4 + R_4^1 i) = K_4 - \mathbf{i}K_1 - \mathbf{j}K_2 + \mathbf{k}K_3 + (K_4 + \mathbf{i}K_1 - \mathbf{j}K_2 - \mathbf{k}K_3)i$$

$$K_4\psi^{25}_{R4} = 0$$
$$\psi^{26}_{R4} \equiv (R^4_4 - R^1_4 i) = K_4 - \mathbf{i}K_1 - \mathbf{j}K_2 + \mathbf{k}K_3 - (K_4 + \mathbf{i}K_1 - \mathbf{j}K_2 - \mathbf{k}K_3)i$$
$$K_4\psi^{26}_{R4} = 0$$
$$\psi^{27}_{R4} \equiv (R^4_4 + R^2_4 i) = K_4 - \mathbf{i}K_1 - \mathbf{j}K_2 + \mathbf{k}K_3 + (K_4 + \mathbf{i}K_1 + \mathbf{j}K_2 + \mathbf{k}K_3)i$$
$$K_4\psi^{27}_{R4} = 0$$
$$\psi^{28}_{R4} \equiv (R^4_4 - R^2_4 i) = K_4 - \mathbf{i}K_1 - \mathbf{j}K_2 + \mathbf{k}K_3 - (K_4 + \mathbf{i}K_1 + \mathbf{j}K_2 + \mathbf{k}K_3)i$$
$$K_4\psi^{28}_{R4} = 0$$
$$\psi^{29}_{R4} \equiv (R^4_4 + R^3_4 i) = K_4 - \mathbf{i}K_1 - \mathbf{j}K_2 + \mathbf{k}K_3 + (K_4 - \mathbf{i}K_1 + \mathbf{j}K_2 - \mathbf{k}K_3)i$$
$$K_4\psi^{29}_{R4} = 0$$
$$\psi^{30}_{R4} \equiv (R^4_4 - R^3_4 i) = K_4 - \mathbf{i}K_1 - \mathbf{j}K_2 + \mathbf{k}K_3 - (K_4 - \mathbf{i}K_1 + \mathbf{j}K_2 - \mathbf{k}K_3)i$$
$$K_4\psi^{30}_{R4} = 0$$
$$\psi^{31}_{R4} \equiv (R^4_4 + R^4_4 i) = K_4 - \mathbf{i}K_1 - \mathbf{j}K_2 + \mathbf{k}K_3 + (K_4 - \mathbf{i}K_1 - \mathbf{j}K_2 + \mathbf{k}K_3)i$$
$$K_4\psi^{31}_{R4} = 0$$
$$\psi^{32}_{R4} \equiv (R^4_4 - R^4_4 i) = K_4 - \mathbf{i}K_1 - \mathbf{j}K_2 + \mathbf{k}K_3 - (K_4 - \mathbf{i}K_1 - \mathbf{j}K_2 + \mathbf{k}K_3)i$$
$$K_4\psi^{32}_{R4} = 0$$

Symmetry with ψ_{L1} solutions
[1, 2, 3, 4, 9, 10, 11, 12]

$$i\psi^1_{L1} + \psi^2_{L1} = 0$$
$$i\psi^{11}_{L1} + \psi^{12}_{L1} = 0$$
$$i\psi^3_{L1} + \psi^{10}_{L1} = 0$$
$$i\psi^9_{L1} + \psi^4_{L1} = 0$$

[1, 2, 11, 12]

$$\mathbf{i}\psi^1_{L1} - \psi^2_{L1} = -2E - 2m + (-2E - 2m)\gamma_t - 21p_x\gamma_x - 21p_y\gamma_y - 21p_z\gamma_z + (-2E - 2m)\gamma_w - 21p_x\gamma_t\gamma_x - 21p_y\gamma_t\gamma_y + 21p_z\gamma_x\gamma_y - 21p_z\gamma_t\gamma_z - 21p_y\gamma_x\gamma_z + 21p_x\gamma_y\gamma_z + (2m +$$
$$\mathbf{j}\psi^1_{L1} + \psi^{11}_{L1} = -2E - 21m\gamma_t + 21E\gamma_w - 21p_x\gamma_t\gamma_x - 21p_y\gamma_t\gamma_y - 21p_z\gamma_x\gamma_y - 21p_z\gamma_t\gamma_z + 21p_y\gamma_x\gamma_z - 21p_x\gamma_y\gamma_z - 21m\gamma_t\gamma_w + 21m\gamma_x\gamma_y\gamma_z + 21p_x\gamma_t\gamma_x\gamma_w + 21p_y\gamma_t\gamma_y\gamma_w + 21p$$
$$\mathbf{k}\psi^1_{L1} - \psi^{12}_{L1} = -2m - 21E\gamma_t - 21p_x\gamma_x - 21p_y\gamma_y - 21p_z\gamma_z - 21m\gamma_w + 21E\gamma_t\gamma_w + 21p_x\gamma_x\gamma_w + 21p_y\gamma_y\gamma_w + 21p_z\gamma_z\gamma_w - 21p_z\gamma_t\gamma_x\gamma_y + 21p_y\gamma_t\gamma_x\gamma_z - 21p_x\gamma_t\gamma_y\gamma_z - 21E\gamma_x\gamma_y$$

[3, 10]

$$\mathbf{i}\psi^3_{L1} - \psi^3_{L1} = (-2E - 2m)\gamma_w + (2m + 2E)\gamma_t\gamma_w + 21p_x\gamma_x\gamma_w + 21p_y\gamma_y\gamma_w + 21p_z\gamma_z\gamma_w - 21p_x\gamma_t\gamma_x\gamma_w - 21p_y\gamma_t\gamma_y\gamma_w + 21p_z\gamma_x\gamma_y\gamma_w - 21p_z\gamma_t\gamma_z\gamma_w - 21p_y\gamma_x\gamma_z\gamma_w + 21p_x\gamma$$
$$\mathbf{j}\psi^3_{L1} + \psi^{10}_{L1} = 2E + 21m\gamma_t + 21E\gamma_w + 21p_x\gamma_t\gamma_x + 21p_y\gamma_t\gamma_y - 21p_z\gamma_x\gamma_y + 21p_z\gamma_t\gamma_z + 21p_y\gamma_x\gamma_z - 21p_x\gamma_y\gamma_z - 21m\gamma_t\gamma_w + 21m\gamma_x\gamma_y\gamma_z + 21p_x\gamma_t\gamma_x\gamma_w + 21p_y\gamma_t\gamma_y\gamma_w + 21p_z$$
$$\mathbf{k}\psi^3_{L1} - \psi^{10}_{L1} = -2E - 21m\gamma_t - 21m\gamma_w - 21p_x\gamma_t\gamma_x - 21p_y\gamma_t\gamma_y + 21p_z\gamma_x\gamma_y - 21p_z\gamma_t\gamma_z - 21p_y\gamma_x\gamma_z + 21p_x\gamma_y\gamma_z + 21E\gamma_t\gamma_w + 21p_x\gamma_x\gamma_w + 21p_y\gamma_y\gamma_w + 21p_z\gamma_z\gamma_w - 21m\gamma_x\gamma_y$$

[4, 9]

$\mathbf{i}\psi^4_{L1}-\psi^4_{L1} = (-2E-2m)\,\gamma_w+(2m+2E)\,\gamma_t\gamma_w+21p_x\gamma_x\gamma_w+21p_y\gamma_y\gamma_w+21p_z\gamma_z\gamma_w-21p_x\gamma_t\gamma_x\gamma_w-21p_y\gamma_t\gamma_y\gamma_w+21p_z\gamma_x\gamma_y\gamma_w-21p_z\gamma_t\gamma_z\gamma_w-21p_y\gamma_x\gamma_z\gamma_w+21p_x\gamma$

$\mathbf{j}\psi^4_{L1}+\psi^9_{L1} = -2E-21m\gamma_t+21E\gamma_w-21p_x\gamma_t\gamma_x-21p_y\gamma_t\gamma_y+21p_z\gamma_x\gamma_y-21p_z\gamma_t\gamma_z-21p_y\gamma_x\gamma_z+21p_x\gamma_y\gamma_z-21m\gamma_t\gamma_w-21m\gamma_x\gamma_y\gamma_z+21p_x\gamma_t\gamma_x\gamma_w+21p_y\gamma_t\gamma_y\gamma_w+21p$

$\mathbf{k}\psi^4_{L1}-\psi^9_{L1} = 2E+21m\gamma_t-21m\gamma_w+21p_x\gamma_t\gamma_x+21p_y\gamma_t\gamma_y-21p_z\gamma_x\gamma_y+21p_z\gamma_t\gamma_z+21p_y\gamma_x\gamma_z-21p_x\gamma_y\gamma_z+21E\gamma_t\gamma_w+21p_x\gamma_x\gamma_w+21p_y\gamma_y\gamma_w+21p_z\gamma_z\gamma_w+21m\gamma_x\gamma_y\gamma$

[5, 6, 15, 16, 17, 18, 27, 28]

$$i\psi^5_{L1}+\psi^{18}_{L1}=0$$
$$i\psi^{17}_{L1}+\psi^6_{L1}=0$$
$$i\psi^{15}_{L1}+\psi^{28}_{L1}=0$$
$$i\psi^{27}_{L1}+\psi^{16}_{L1}=0$$

[7, 8, 13, 14, 19, 20, 25, 26]

$$i\psi^7_{L1}+\psi^{26}_{L1}=0$$
$$i\psi^{25}_{L1}+\psi^8_{L1}=0$$
$$i\psi^{13}_{L1}+\psi^{20}_{L1}=0$$
$$i\psi^{19}_{L1}+\psi^{14}_{L1}=0$$

[5, 6, 16, 15]

$\mathbf{i}\psi^5_{L1}-\psi^6_{L1} = (-2E-2m)\,\gamma_w+(2m+2E)\,\gamma_t\gamma_w+21p_x\gamma_x\gamma_w+21p_y\gamma_y\gamma_w+21p_z\gamma_z\gamma_w-21p_x\gamma_t\gamma_x\gamma_w-21p_y\gamma_t\gamma_y\gamma_w+21p_z\gamma_x\gamma_y\gamma_w-21p_z\gamma_t\gamma_z\gamma_w-21p_y\gamma_x\gamma_z\gamma_w+21p_x\gamma$

$\mathbf{j}\psi^5_{L1}+\psi^{16}_{L1} = -2E-21m\gamma_t+21E\gamma_w-21p_x\gamma_t\gamma_x-21p_y\gamma_t\gamma_y+21p_z\gamma_x\gamma_y-21p_z\gamma_t\gamma_z-21p_y\gamma_x\gamma_z+21p_x\gamma_y\gamma_z-21m\gamma_t\gamma_w-21m\gamma_x\gamma_y\gamma_z+21p_x\gamma_t\gamma_x\gamma_w+21p_y\gamma_t\gamma_y\gamma_w+21p$

$\mathbf{k}\psi^5_{L1}-\psi^{15}_{L1} = -2E-21m\gamma_t-21m\gamma_w-21p_x\gamma_t\gamma_x-21p_y\gamma_t\gamma_y+21p_z\gamma_x\gamma_y-21p_z\gamma_t\gamma_z-21p_y\gamma_x\gamma_z+21p_x\gamma_y\gamma_z+21E\gamma_t\gamma_w+21p_x\gamma_x\gamma_w+21p_y\gamma_y\gamma_w+21p_z\gamma_z\gamma_w-21m\gamma_x\gamma_y$

[7, 13]

$\mathbf{i}\psi^7_{L1}-\psi^7_{L1} = 2m-2E+(2E-2m)\,\gamma_t+21p_x\gamma_x+21p_y\gamma_y+21p_z\gamma_z+(-2E-2m)\,\gamma_w-21p_x\gamma_t\gamma_x-21p_y\gamma_t\gamma_y+21p_z\gamma_x\gamma_y-21p_z\gamma_t\gamma_z-21p_y\gamma_x\gamma_z+21p_x\gamma_y\gamma_z+(2m+2E$

$\mathbf{j}\psi^7_{L1}+\psi^{13}_{1} = 2E+21m\gamma_t+21E\gamma_w+21p_x\gamma_t\gamma_x+21p_y\gamma_t\gamma_y+21p_z\gamma_x\gamma_y+21p_z\gamma_t\gamma_z-21p_y\gamma_x\gamma_z+21p_x\gamma_y\gamma_z-21m\gamma_t\gamma_w-21m\gamma_x\gamma_y\gamma_z+21p_x\gamma_t\gamma_x\gamma_w+21p_y\gamma_t\gamma_y\gamma_w+21p_z\gamma$

$\mathbf{k}\psi^7_{L1}-\psi^{13}_{L1} = 2m+21E\gamma_t+21p_x\gamma_x+21p_y\gamma_y+21p_z\gamma_z-21m\gamma_w+21E\gamma_t\gamma_w+21p_x\gamma_x\gamma_w+21p_y\gamma_y\gamma_w+21p_z\gamma_z\gamma_w+21p_z\gamma_t\gamma_x\gamma_y-21p_y\gamma_t\gamma_x\gamma_z+21p_x\gamma_t\gamma_y\gamma_z+21E\gamma_x\gamma_y\gamma$

[8, 14]

$\mathbf{i}\psi^8_{L1}-\psi^8_{L1} = 2E-2m+(2m-2E)\,\gamma_t-21p_x\gamma_x-21p_y\gamma_y-21p_z\gamma_z+(-2E-2m)\,\gamma_w+21p_x\gamma_t\gamma_x+21p_y\gamma_t\gamma_y-21p_z\gamma_x\gamma_y+21p_z\gamma_t\gamma_z+21p_y\gamma_x\gamma_z-21p_x\gamma_y\gamma_z+(2m+2E$

$\mathbf{j}\psi^8_{L1}+\psi^{14}_{1} = -2E-21m\gamma_t+21E\gamma_w-21p_x\gamma_t\gamma_x-21p_y\gamma_t\gamma_y-21p_z\gamma_x\gamma_y-21p_z\gamma_t\gamma_z+21p_y\gamma_x\gamma_z-21p_x\gamma_y\gamma_z-21m\gamma_t\gamma_w+21m\gamma_x\gamma_y\gamma_z+21p_x\gamma_t\gamma_x\gamma_w+21p_y\gamma_t\gamma_y\gamma_w+21p$

$\mathbf{k}\psi^8_{L1}-\psi^{14}_{L1} = -2m-21E\gamma_t-21p_x\gamma_x-21p_y\gamma_y-21p_z\gamma_z-21m\gamma_w+21E\gamma_t\gamma_w+21p_x\gamma_x\gamma_w+21p_y\gamma_y\gamma_w+21p_z\gamma_z\gamma_w-21p_z\gamma_t\gamma_x\gamma_y+21p_y\gamma_t\gamma_x\gamma_z-21p_x\gamma_t\gamma_y\gamma_z-21E\gamma_x\gamma_y$

[17, 18, 28, 27]

$\mathbf{i}\psi^{17}_{L1}-\psi^{18}_{L1} = -2E-2m+(-2E-2m)\,\gamma_t-21p_x\gamma_x-21p_y\gamma_y-21p_z\gamma_z-21p_x\gamma_t\gamma_x-21p_y\gamma_t\gamma_y+21p_z\gamma_x\gamma_y-21p_z\gamma_t\gamma_z-21p_y\gamma_x\gamma_z+21p_x\gamma_y\gamma_z+21p_z\gamma_t\gamma_x\gamma_y-21p_y\gamma_t\gamma_x\gamma$

$\mathbf{j}\psi^{17}_{L1}-\psi^{28}_{L1} = -2E-21m\gamma_t+21E\gamma_w-21p_x\gamma_t\gamma_x-21p_y\gamma_t\gamma_y-21p_z\gamma_x\gamma_y-21p_z\gamma_t\gamma_z+21p_y\gamma_x\gamma_z-21p_x\gamma_y\gamma_z-21m\gamma_t\gamma_w+21m\gamma_x\gamma_y\gamma_z+21p_x\gamma_t\gamma_x\gamma_w+21p_y\gamma_t\gamma_y\gamma_w-21p$

$\mathbf{k}\psi^{17}_{L1}+\psi^{27}_{L1} = -2m-21E\gamma_t-21p_x\gamma_x-21p_y\gamma_y-21p_z\gamma_z-21E\gamma_w+21m\gamma_t\gamma_w-21p_z\gamma_t\gamma_x\gamma_y+21p_y\gamma_t\gamma_x\gamma_z-21p_x\gamma_t\gamma_y\gamma_z-21E\gamma_x\gamma_y\gamma_z-21p_x\gamma_t\gamma_x\gamma_w-21p_y\gamma_t\gamma_y\gamma_w+21p$

[19, 25]

$\mathbf{i}\psi^{19}_{L1} - \psi^{19}_{L1} = 0$

$\mathbf{j}\psi^{19}_{L1}-\psi^{25}_{L1} = 2E+21m\gamma_t+21E\gamma_w+21p_x\gamma_t\gamma_x+21p_y\gamma_t\gamma_y-21p_z\gamma_x\gamma_y+21p_z\gamma_t\gamma_z+21p_y\gamma_x\gamma_z-21p_x\gamma_y\gamma_z-21m\gamma_t\gamma_w+21m\gamma_x\gamma_y\gamma_z+21p_x\gamma_t\gamma_x\gamma_w+21p_y\gamma_t\gamma_y\gamma_w-21p_z$

$\mathbf{k}\psi^{19}_{L1}+\psi^{25}_{L1} = -2E-21m\gamma_t-21E\gamma_w-21p_x\gamma_t\gamma_x-21p_y\gamma_t\gamma_y+21p_z\gamma_x\gamma_y-21p_z\gamma_t\gamma_z-21p_y\gamma_x\gamma_z+21p_x\gamma_y\gamma_z+21m\gamma_t\gamma_w-21m\gamma_x\gamma_y\gamma_z-21p_x\gamma_t\gamma_x\gamma_w-21p_y\gamma_t\gamma_y\gamma_w+21p$

[20, 26]

$\mathbf{i}\psi^{20}_{L1} - \psi^{20}_{L1} = 0$

$\mathbf{j}\psi^{20}_{L1}-\psi^{26}_{L1} = -2E-21m\gamma_t+21E\gamma_w-21p_x\gamma_t\gamma_x-21p_y\gamma_t\gamma_y+21p_z\gamma_x\gamma_y-21p_z\gamma_t\gamma_z-21p_y\gamma_x\gamma_z+21p_x\gamma_y\gamma_z-21m\gamma_t\gamma_w-21m\gamma_x\gamma_y\gamma_z+21p_x\gamma_t\gamma_x\gamma_w+21p_y\gamma_t\gamma_y\gamma_w-21p$

$\mathbf{k}\psi^{20}_{L1}+\psi^{26}_{L1} = 2E+21m\gamma_t-21E\gamma_w+21p_x\gamma_t\gamma_x+21p_y\gamma_t\gamma_y-21p_z\gamma_x\gamma_y+21p_z\gamma_t\gamma_z+21p_y\gamma_x\gamma_z-21p_x\gamma_y\gamma_z+21m\gamma_t\gamma_w+21m\gamma_x\gamma_y\gamma_z-21p_x\gamma_t\gamma_x\gamma_w-21p_y\gamma_t\gamma_y\gamma_w+21p_z$

[21, 22, 23, 24, 29, 30, 31, 32]

$i\psi^{21}_{L1} + \psi^{22}_{L1} = 0$

$i\psi^{31}_{L1} + \psi^{32}_{L1} = 0$

$i\psi^{23}_{L1} + \psi^{30}_{L1} = 0$

$i\psi^{29}_{L1} + \psi^{24}_{L1} = 0$

[21, 22, 31, 32]

$\mathbf{i}\psi^{21}_{L1} - \psi^{22}_{L1} = 0$

$\mathbf{j}\psi^{21}_{L1}-\psi^{31}_{L1} = -2E-21m\gamma_t+21E\gamma_w-21p_x\gamma_t\gamma_x-21p_y\gamma_t\gamma_y+21p_z\gamma_x\gamma_y-21p_z\gamma_t\gamma_z-21p_y\gamma_x\gamma_z+21p_x\gamma_y\gamma_z-21m\gamma_t\gamma_w-21m\gamma_x\gamma_y\gamma_z+21p_x\gamma_t\gamma_x\gamma_w+21p_y\gamma_t\gamma_y\gamma_w-21p$

$\mathbf{k}\psi^{21}_{L1}+\psi^{32}_{L1} = -2E-21m\gamma_t-21E\gamma_w-21p_x\gamma_t\gamma_x-21p_y\gamma_t\gamma_y+21p_z\gamma_x\gamma_y-21p_z\gamma_t\gamma_z-21p_y\gamma_x\gamma_z+21p_x\gamma_y\gamma_z+21m\gamma_t\gamma_w-21m\gamma_x\gamma_y\gamma_z-21p_x\gamma_t\gamma_x\gamma_w-21p_y\gamma_t\gamma_y\gamma_w+21p$

[23, 30]

$\mathbf{i}\psi^{23}_{L1}-\psi^{23}_{L1} = 2m-2E+(2E-2m)\,\gamma_t+21p_x\gamma_x+21p_y\gamma_y+21p_z\gamma_z-21p_x\gamma_t\gamma_x-21p_y\gamma_t\gamma_y+21p_z\gamma_x\gamma_y-21p_z\gamma_t\gamma_z-21p_y\gamma_x\gamma_z+21p_x\gamma_y\gamma_z-21p_z\gamma_t\gamma_x\gamma_y+21p_y\gamma_t\gamma_x\gamma_z-2$

$\mathbf{j}\psi^{23}_{L1}-\psi^{30}_{L1} = 2E+21m\gamma_t+21E\gamma_w+21p_x\gamma_t\gamma_x+21p_y\gamma_t\gamma_y+21p_z\gamma_x\gamma_y+21p_z\gamma_t\gamma_z-21p_y\gamma_x\gamma_z+21p_x\gamma_y\gamma_z-21m\gamma_t\gamma_w-21m\gamma_x\gamma_y\gamma_z+21p_x\gamma_t\gamma_x\gamma_w+21p_y\gamma_t\gamma_y\gamma_w-21p_z$

$\mathbf{k}\psi^{23}_{L1}+\psi^{30}_{L1} = 2m+21E\gamma_t+21p_x\gamma_x+21p_y\gamma_y+21p_z\gamma_z-21E\gamma_w+21m\gamma_t\gamma_w+21p_z\gamma_t\gamma_x\gamma_y-21p_y\gamma_t\gamma_x\gamma_z+21p_x\gamma_t\gamma_y\gamma_z+21E\gamma_x\gamma_y\gamma_z-21p_x\gamma_t\gamma_x\gamma_w-21p_y\gamma_t\gamma_y\gamma_w+21p_z$

[24, 29]

$\mathbf{i}\psi^{24}_{L1}-\psi^{24}_{L1} = 2E-2m+(2m-2E)\,\gamma_t-21p_x\gamma_x-21p_y\gamma_y-21p_z\gamma_z+21p_x\gamma_t\gamma_x+21p_y\gamma_t\gamma_y-21p_z\gamma_x\gamma_y+21p_z\gamma_t\gamma_z+21p_y\gamma_x\gamma_z-21p_x\gamma_y\gamma_z+21p_z\gamma_t\gamma_x\gamma_y-21p_y\gamma_t\gamma_x\gamma_z+2$

$\mathbf{j}\psi^{24}_{L1}-\psi^{29}_{L1} = -2E-21m\gamma_t+21E\gamma_w-21p_x\gamma_t\gamma_x-21p_y\gamma_t\gamma_y-21p_z\gamma_x\gamma_y-21p_z\gamma_t\gamma_z+21p_y\gamma_x\gamma_z-21p_x\gamma_y\gamma_z-21m\gamma_t\gamma_w+21m\gamma_x\gamma_y\gamma_z+21p_x\gamma_t\gamma_x\gamma_w+21p_y\gamma_t\gamma_y\gamma_w-21p$

$\mathbf{k}\psi^{24}_{L1}+\psi^{29}_{L1} = -2m-21E\gamma_t-21p_x\gamma_x-21p_y\gamma_y-21p_z\gamma_z-21E\gamma_w+21m\gamma_t\gamma_w-21p_z\gamma_t\gamma_x\gamma_y+21p_y\gamma_t\gamma_x\gamma_z-21p_x\gamma_t\gamma_y\gamma_z-21E\gamma_x\gamma_y\gamma_z-21p_x\gamma_t\gamma_x\gamma_w-21p_y\gamma_t\gamma_y\gamma_w+21p$

Rotations ψ_{L1}

$\mathbf{i}\psi^{1}_{L1}\mathbf{i}-\psi^{22}_{L4} = -2m-21E\gamma_t+21p_x\gamma_x+21p_y\gamma_y+21p_z\gamma_z-21m\gamma_w+21E\gamma_t\gamma_w-21p_x\gamma_x\gamma_w-21p_y\gamma_y\gamma_w-21p_z\gamma_z\gamma_w+21p_z\gamma_t\gamma_x\gamma_y-21p_y\gamma_t\gamma_x\gamma_z+21p_x\gamma_t\gamma_y\gamma_z-21E\gamma_x\gamma_y$

$$\mathbf{j}\psi^{1}_{L1}\mathbf{j}+\psi^{31}_{L3} = 2m+2E+(-2E-2m)\,\gamma_t-21p_x\gamma_x-21p_y\gamma_y-21p_z\gamma_z+(-2E-2m)\,\gamma_w+21p_x\gamma_t\gamma_x+21p_y\gamma_t\gamma_y-21p_z\gamma_x\gamma_y+21p_z\gamma_t\gamma_z+21p_y\gamma_x\gamma_z-21p_x\gamma_y\gamma_z+(-2E$$

$$\mathbf{k}\psi^{1}_{L1}\mathbf{k}-\psi^{12}_{L2} = -2E+21m\gamma_t-21E\gamma_w+21p_x\gamma_t\gamma_x+21p_y\gamma_t\gamma_y+21p_z\gamma_x\gamma_y+21p_z\gamma_t\gamma_z-21p_y\gamma_x\gamma_z+21p_x\gamma_y\gamma_z-21m\gamma_t\gamma_w-21m\gamma_x\gamma_y\gamma_z+21p_x\gamma_t\gamma_x\gamma_w+21p_y\gamma_t\gamma_y\gamma_w+2$$

$$\mathbf{i}\psi^{2}_{L1}\mathbf{i}-\psi^{21}_{L4} = 2m+21E\gamma_t-21p_x\gamma_x-21p_y\gamma_y-21p_z\gamma_z-21m\gamma_w+21E\gamma_t\gamma_w-21p_x\gamma_x\gamma_w-21p_y\gamma_y\gamma_w-21p_z\gamma_z\gamma_w-21p_z\gamma_t\gamma_x\gamma_y+21p_y\gamma_t\gamma_x\gamma_z-21p_x\gamma_t\gamma_y\gamma_z+21E\gamma_x\gamma_y\gamma$$

$$\mathbf{j}\psi^{2}_{L1}\mathbf{j}+\psi^{32}_{L3} = -2E-2m+(2m+2E)\,\gamma_t+21p_x\gamma_x+21p_y\gamma_y+21p_z\gamma_z+(-2E-2m)\,\gamma_w-21p_x\gamma_t\gamma_x-21p_y\gamma_t\gamma_y+21p_z\gamma_x\gamma_y-21p_z\gamma_t\gamma_z-21p_y\gamma_x\gamma_z+21p_x\gamma_y\gamma_z+(-2E$$

$$\mathbf{k}\psi^{2}_{L1}\mathbf{k}-\psi^{11}_{L2} = 2E-21m\gamma_t-21E\gamma_w-21p_x\gamma_t\gamma_x-21p_y\gamma_t\gamma_y-21p_z\gamma_x\gamma_y-21p_z\gamma_t\gamma_z+21p_y\gamma_x\gamma_z-21p_x\gamma_y\gamma_z-21m\gamma_t\gamma_w+21m\gamma_x\gamma_y\gamma_z+21p_x\gamma_t\gamma_x\gamma_w+21p_y\gamma_t\gamma_y\gamma_w+21p$$

$$\mathbf{i}\psi^{3}_{L1}\mathbf{i}-\psi^{24}_{L4} = -2m-21E\gamma_t+21p_x\gamma_x+21p_y\gamma_y+21p_z\gamma_z-21m\gamma_w+21E\gamma_t\gamma_w-21p_x\gamma_x\gamma_w-21p_y\gamma_y\gamma_w-21p_z\gamma_z\gamma_w-21p_z\gamma_t\gamma_x\gamma_y+21p_y\gamma_t\gamma_x\gamma_z-21p_x\gamma_t\gamma_y\gamma_z+21E\gamma_x\gamma_y$$

$$\mathbf{j}\psi^{3}_{L1}\mathbf{j}+\psi^{29}_{L3} = 2m+2E+(-2E-2m)\,\gamma_t-21p_x\gamma_x-21p_y\gamma_y-21p_z\gamma_z+(-2E-2m)\,\gamma_w+21p_x\gamma_t\gamma_x+21p_y\gamma_t\gamma_y+21p_z\gamma_x\gamma_y+21p_z\gamma_t\gamma_z-21p_y\gamma_x\gamma_z+21p_x\gamma_y\gamma_z+(-2E$$

$$\mathbf{k}\psi^{3}_{L1}\mathbf{k}-\psi^{10}_{L2} = -2E+21m\gamma_t-21E\gamma_w+21p_x\gamma_t\gamma_x+21p_y\gamma_t\gamma_y-21p_z\gamma_x\gamma_y+21p_z\gamma_t\gamma_z+21p_y\gamma_x\gamma_z-21p_x\gamma_y\gamma_z-21m\gamma_t\gamma_w+21m\gamma_x\gamma_y\gamma_z+21p_x\gamma_t\gamma_x\gamma_w+21p_y\gamma_t\gamma_y\gamma_w+2$$

$$\mathbf{i}\psi^{4}_{L1}\mathbf{i}-\psi^{23}_{L4} = 2m+21E\gamma_t-21p_x\gamma_x-21p_y\gamma_y-21p_z\gamma_z-21m\gamma_w+21E\gamma_t\gamma_w-21p_x\gamma_x\gamma_w-21p_y\gamma_y\gamma_w-21p_z\gamma_z\gamma_w+21p_z\gamma_t\gamma_x\gamma_y-21p_y\gamma_t\gamma_x\gamma_z+21p_x\gamma_t\gamma_y\gamma_z-21E\gamma_x\gamma_y\gamma$$

$$\mathbf{j}\psi^{4}_{L1}\mathbf{j}+\psi^{30}_{L3} = -2E-2m+(2m+2E)\,\gamma_t+21p_x\gamma_x+21p_y\gamma_y+21p_z\gamma_z+(-2E-2m)\,\gamma_w-21p_x\gamma_t\gamma_x-21p_y\gamma_t\gamma_y-21p_z\gamma_x\gamma_y-21p_z\gamma_t\gamma_z+21p_y\gamma_x\gamma_z-21p_x\gamma_y\gamma_z+(-2E$$

$$\mathbf{k}\psi^{4}_{L1}\mathbf{k}-\psi^{9}_{L2} = 2E-21m\gamma_t-21E\gamma_w-21p_x\gamma_t\gamma_x-21p_y\gamma_t\gamma_y+21p_z\gamma_x\gamma_y-21p_z\gamma_t\gamma_z-21p_y\gamma_x\gamma_z+21p_x\gamma_y\gamma_z-21m\gamma_t\gamma_w-21m\gamma_x\gamma_y\gamma_z+21p_x\gamma_t\gamma_x\gamma_w+21p_y\gamma_t\gamma_y\gamma_w+21p$$

$$\mathbf{i}\psi^{5}_{L1}\mathbf{i}-\psi^{18}_{L4} = -2m-21E\gamma_t+21p_x\gamma_x+21p_y\gamma_y+21p_z\gamma_z-21m\gamma_w+21E\gamma_t\gamma_w-21p_x\gamma_x\gamma_w-21p_y\gamma_y\gamma_w-21p_z\gamma_z\gamma_w-21p_z\gamma_t\gamma_x\gamma_y+21p_y\gamma_t\gamma_x\gamma_z-21p_x\gamma_t\gamma_y\gamma_z+21E\gamma_x\gamma_y$$

$$\mathbf{j}\psi^{5}_{L1}\mathbf{j}+\psi^{27}_{L3} = 2m-2E+(2m-2E)\,\gamma_t-21p_x\gamma_x-21p_y\gamma_y-21p_z\gamma_z+(-2E-2m)\,\gamma_w-21p_x\gamma_t\gamma_x-21p_y\gamma_t\gamma_y-21p_z\gamma_x\gamma_y-21p_z\gamma_t\gamma_z+21p_y\gamma_x\gamma_z-21p_x\gamma_y\gamma_z+(-2E$$

$$\mathbf{k}\psi^{5}_{L1}\mathbf{k}-\psi^{16}_{L2} = 2E-21m\gamma_t-21E\gamma_w-21p_x\gamma_t\gamma_x-21p_y\gamma_t\gamma_y+21p_z\gamma_x\gamma_y-21p_z\gamma_t\gamma_z-21p_y\gamma_x\gamma_z+21p_x\gamma_y\gamma_z-21m\gamma_t\gamma_w-21m\gamma_x\gamma_y\gamma_z+21p_x\gamma_t\gamma_x\gamma_w+21p_y\gamma_t\gamma_y\gamma_w+21p$$

$$\mathbf{i}\psi^{6}_{L1}\mathbf{i}-\psi^{17}_{L4} = 2m+21E\gamma_t-21p_x\gamma_x-21p_y\gamma_y-21p_z\gamma_z-21m\gamma_w+21E\gamma_t\gamma_w-21p_x\gamma_x\gamma_w-21p_y\gamma_y\gamma_w-21p_z\gamma_z\gamma_w+21p_z\gamma_t\gamma_x\gamma_y-21p_y\gamma_t\gamma_x\gamma_z+21p_x\gamma_t\gamma_y\gamma_z-21E\gamma_x\gamma_y\gamma$$

$$\mathbf{j}\psi^{6}_{L1}\mathbf{j}+\psi^{28}_{L3} = 2E-2m+(2E-2m)\,\gamma_t+21p_x\gamma_x+21p_y\gamma_y+21p_z\gamma_z+(-2E-2m)\,\gamma_w+21p_x\gamma_t\gamma_x+21p_y\gamma_t\gamma_y+21p_z\gamma_x\gamma_y+21p_z\gamma_t\gamma_z-21p_y\gamma_x\gamma_z+21p_x\gamma_y\gamma_z+(-2E$$

$$\mathbf{k}\psi^{6}_{L1}\mathbf{k}-\psi^{15}_{L2} = -2E+21m\gamma_t-21E\gamma_w+21p_x\gamma_t\gamma_x+21p_y\gamma_t\gamma_y-21p_z\gamma_x\gamma_y+21p_z\gamma_t\gamma_z+21p_y\gamma_x\gamma_z-21p_x\gamma_y\gamma_z-21m\gamma_t\gamma_w+21m\gamma_x\gamma_y\gamma_z+21p_x\gamma_t\gamma_x\gamma_w+21p_y\gamma_t\gamma_y\gamma_w+2$$

$$\mathbf{i}\psi^{7}_{L1}\mathbf{i}-\psi^{20}_{L4} = -2m-21E\gamma_t+21p_x\gamma_x+21p_y\gamma_y+21p_z\gamma_z-21m\gamma_w+21E\gamma_t\gamma_w-21p_x\gamma_x\gamma_w-21p_y\gamma_y\gamma_w-21p_z\gamma_z\gamma_w+21p_z\gamma_t\gamma_x\gamma_y-21p_y\gamma_t\gamma_x\gamma_z+21p_x\gamma_t\gamma_y\gamma_z-21E\gamma_x\gamma_y$$

$$\mathbf{j}\psi^{7}_{L1}\mathbf{j}+\psi^{25}_{L3} = 2m-2E+(2m-2E)\,\gamma_t-21p_x\gamma_x-21p_y\gamma_y-21p_z\gamma_z+(-2E-2m)\,\gamma_w-21p_x\gamma_t\gamma_x-21p_y\gamma_t\gamma_y+21p_z\gamma_x\gamma_y-21p_z\gamma_t\gamma_z-21p_y\gamma_x\gamma_z+21p_x\gamma_y\gamma_z+(-2E$$

$$\mathbf{k}\psi^{7}_{L1}\mathbf{k}-\psi^{14}_{L2} = 2E-21m\gamma_t-21E\gamma_w-21p_x\gamma_t\gamma_x-21p_y\gamma_t\gamma_y-21p_z\gamma_x\gamma_y-21p_z\gamma_t\gamma_z+21p_y\gamma_x\gamma_z-21p_x\gamma_y\gamma_z-21m\gamma_t\gamma_w+21m\gamma_x\gamma_y\gamma_z+21p_x\gamma_t\gamma_x\gamma_w+21p_y\gamma_t\gamma_y\gamma_w+21p$$

$$\mathbf{i}\psi^{8}_{L1}\mathbf{i}-\psi^{19}_{L4} = 2m+21E\gamma_t-21p_x\gamma_x-21p_y\gamma_y-21p_z\gamma_z-21m\gamma_w+21E\gamma_t\gamma_w-21p_x\gamma_x\gamma_w-21p_y\gamma_y\gamma_w-21p_z\gamma_z\gamma_w-21p_z\gamma_t\gamma_x\gamma_y+21p_y\gamma_t\gamma_x\gamma_z-21p_x\gamma_t\gamma_y\gamma_z+21E\gamma_x\gamma_y\gamma$$

$$\mathbf{j}\psi^{8}_{L1}\mathbf{j}+\psi^{26}_{L3} = 2E-2m+(2E-2m)\,\gamma_t+21p_x\gamma_x+21p_y\gamma_y+21p_z\gamma_z+(-2E-2m)\,\gamma_w+21p_x\gamma_t\gamma_x+21p_y\gamma_t\gamma_y-21p_z\gamma_x\gamma_y+21p_z\gamma_t\gamma_z+21p_y\gamma_x\gamma_z-21p_x\gamma_y\gamma_z+(-2E$$

$$\mathbf{k}\psi^{8}_{L1}\mathbf{k}-\psi^{13}_{L2} = -2E+21m\gamma_t-21E\gamma_w+21p_x\gamma_t\gamma_x+21p_y\gamma_t\gamma_y+21p_z\gamma_x\gamma_y+21p_z\gamma_t\gamma_z-21p_y\gamma_x\gamma_z+21p_x\gamma_y\gamma_z-21m\gamma_t\gamma_w-21m\gamma_x\gamma_y\gamma_z+21p_x\gamma_t\gamma_x\gamma_w+21p_y\gamma_t\gamma_y\gamma_w+2$$

$$\mathbf{i}\psi^{9}_{L1}\mathbf{i}-\psi^{30}_{L4} = -2m-21E\gamma_t+21p_x\gamma_x+21p_y\gamma_y+21p_z\gamma_z-21m\gamma_w+21E\gamma_t\gamma_w-21p_x\gamma_x\gamma_w-21p_y\gamma_y\gamma_w-21p_z\gamma_z\gamma_w+21p_z\gamma_t\gamma_x\gamma_y-21p_y\gamma_t\gamma_x\gamma_z+21p_x\gamma_t\gamma_y\gamma_z-21E\gamma_x\gamma_y$$

$$\mathbf{j}\psi^{9}_{L1}\mathbf{j}+\psi^{23}_{L3} = 2m+2E+(-2E-2m)\,\gamma_t-21p_x\gamma_x-21p_y\gamma_y-21p_z\gamma_z+(-2E-2m)\,\gamma_w+21p_x\gamma_t\gamma_x+21p_y\gamma_t\gamma_y-21p_z\gamma_x\gamma_y+21p_z\gamma_t\gamma_z+21p_y\gamma_x\gamma_z-21p_x\gamma_y\gamma_z+(-2E$$

$$\mathbf{k}\psi^{9}_{L1}\mathbf{k}-\psi^{4}_{L2} = -2E+21m\gamma_t-21E\gamma_w+21p_x\gamma_t\gamma_x+21p_y\gamma_t\gamma_y+21p_z\gamma_x\gamma_y+21p_z\gamma_t\gamma_z-21p_y\gamma_x\gamma_z+21p_x\gamma_y\gamma_z-21m\gamma_t\gamma_w-21m\gamma_x\gamma_y\gamma_z+21p_x\gamma_t\gamma_x\gamma_w+21p_y\gamma_t\gamma_y\gamma_w-2$$

$$\mathbf{i}\psi^{10}_{L1}\mathbf{i}-\psi^{29}_{L4} = 2m+21E\gamma_t-21p_x\gamma_x-21p_y\gamma_y-21p_z\gamma_z-21m\gamma_w+21E\gamma_t\gamma_w-21p_x\gamma_x\gamma_w-21p_y\gamma_y\gamma_w-21p_z\gamma_z\gamma_w-21p_z\gamma_t\gamma_x\gamma_y+21p_y\gamma_t\gamma_x\gamma_z-21p_x\gamma_t\gamma_y\gamma_z+21E\gamma_x\gamma_y\gamma$$

$$\mathbf{j}\psi^{10}_{L1}\mathbf{j}+\psi^{24}_{L3} = -2E-2m+(2m+2E)\,\gamma_t+21p_x\gamma_x+21p_y\gamma_y+21p_z\gamma_z+(-2E-2m)\,\gamma_w-21p_x\gamma_t\gamma_x-21p_y\gamma_t\gamma_y+21p_z\gamma_x\gamma_y-21p_z\gamma_t\gamma_z-21p_y\gamma_x\gamma_z+21p_x\gamma_y\gamma_z+(-2E$$

$$\mathbf{k}\psi^{10}_{L1}\mathbf{k}-\psi^{3}_{L2} = 2E-21m\gamma_t-21E\gamma_w-21p_x\gamma_t\gamma_x-21p_y\gamma_t\gamma_y-21p_z\gamma_x\gamma_y-21p_z\gamma_t\gamma_z+21p_y\gamma_x\gamma_z-21p_x\gamma_y\gamma_z-21m\gamma_t\gamma_w+21m\gamma_x\gamma_y\gamma_z+21p_x\gamma_t\gamma_x\gamma_w+21p_y\gamma_t\gamma_y\gamma_w-21p$$

$$\mathbf{i}\psi^{11}_{L1}\mathbf{i}-\psi^{32}_{L4} = -2m-21E\gamma_t+21p_x\gamma_x+21p_y\gamma_y+21p_z\gamma_z-21m\gamma_w+21E\gamma_t\gamma_w-21p_x\gamma_x\gamma_w-21p_y\gamma_y\gamma_w-21p_z\gamma_z\gamma_w-21p_z\gamma_t\gamma_x\gamma_y+21p_y\gamma_t\gamma_x\gamma_z-21p_x\gamma_t\gamma_y\gamma_z+21E\gamma_x\gamma_y$$

$$\mathbf{j}\psi^{11}_{L1}\mathbf{j}+\psi^{21}_{L3} = 2m+2E+(-2E-2m)\,\gamma_t-21p_x\gamma_x-21p_y\gamma_y-21p_z\gamma_z+(-2E-2m)\,\gamma_w+21p_x\gamma_t\gamma_x+21p_y\gamma_t\gamma_y+21p_z\gamma_x\gamma_y+21p_z\gamma_t\gamma_z-21p_y\gamma_x\gamma_z+21p_x\gamma_y\gamma_z+(-2E$$

$$\mathbf{k}\psi_{L1}^{11}\mathbf{k}-\psi_{L2}^{2}=-2E+21m\gamma_t-21E\gamma_w+21p_x\gamma_t\gamma_x+21p_y\gamma_t\gamma_y-21p_z\gamma_x\gamma_y+21p_z\gamma_t\gamma_z+21p_y\gamma_x\gamma_z-21p_x\gamma_y\gamma_z-21m\gamma_t\gamma_w+21m\gamma_x\gamma_y\gamma_z+21p_x\gamma_t\gamma_x\gamma_w+21p_y\gamma_t\gamma_y\gamma_w$$

$$\mathbf{i}\psi_{L1}^{12}\mathbf{i}-\psi_{L4}^{31}=2m+21E\gamma_t-21p_x\gamma_x-21p_y\gamma_y-21p_z\gamma_z-21m\gamma_w+21E\gamma_t\gamma_w-21p_x\gamma_x\gamma_w-21p_y\gamma_y\gamma_w-21p_z\gamma_z\gamma_w+21p_z\gamma_t\gamma_x\gamma_y-21p_y\gamma_t\gamma_x\gamma_z+21p_x\gamma_t\gamma_y\gamma_z$$

$$\mathbf{j}\psi_{L1}^{12}\mathbf{j}+\psi_{L3}^{22}=-2E-2m+(2m+2E)\,\gamma_t+21p_x\gamma_x+21p_y\gamma_y+21p_z\gamma_z+(-2E-2m)\,\gamma_w-21p_x\gamma_t\gamma_x-21p_y\gamma_t\gamma_y-21p_z\gamma_x\gamma_y-21p_z\gamma_t\gamma_z+21p_y\gamma_x\gamma_z-21p_x\gamma_y\gamma_z$$

$$\mathbf{k}\psi_{L1}^{12}\mathbf{k}-\psi_{L2}^{1}=2E-21m\gamma_t-21E\gamma_w-21p_x\gamma_t\gamma_x-21p_y\gamma_t\gamma_y+21p_z\gamma_x\gamma_y-21p_z\gamma_t\gamma_z-21p_y\gamma_x\gamma_z+21p_x\gamma_y\gamma_z-21m\gamma_t\gamma_w-21m\gamma_x\gamma_y\gamma_z+21p_x\gamma_t\gamma_x\gamma_w+21p_y\gamma_t\gamma_y\gamma_w$$

$$\mathbf{i}\psi_{L1}^{13}\mathbf{i}-\psi_{L4}^{26}=-2m-21E\gamma_t+21p_x\gamma_x+21p_y\gamma_y+21p_z\gamma_z-21m\gamma_w+21E\gamma_t\gamma_w-21p_x\gamma_x\gamma_w-21p_y\gamma_y\gamma_w-21p_z\gamma_z\gamma_w-21p_z\gamma_t\gamma_x\gamma_y+21p_y\gamma_t\gamma_x\gamma_z-21p_x\gamma_t\gamma_y\gamma_z$$

$$\mathbf{j}\psi_{L1}^{13}\mathbf{j}+\psi_{L3}^{19}=2m-2E+(2m-2E)\,\gamma_t-21p_x\gamma_x-21p_y\gamma_y-21p_z\gamma_z+(-2E-2m)\,\gamma_w-21p_x\gamma_t\gamma_x-21p_y\gamma_t\gamma_y-21p_z\gamma_x\gamma_y-21p_z\gamma_t\gamma_z+21p_y\gamma_x\gamma_z-21p_x\gamma_y\gamma_z$$

$$\mathbf{k}\psi_{L1}^{13}\mathbf{k}-\psi_{L2}^{8}=2E-21m\gamma_t-21E\gamma_w-21p_x\gamma_t\gamma_x-21p_y\gamma_t\gamma_y+21p_z\gamma_x\gamma_y-21p_z\gamma_t\gamma_z-21p_y\gamma_x\gamma_z+21p_x\gamma_y\gamma_z-21m\gamma_t\gamma_w-21m\gamma_x\gamma_y\gamma_z+21p_x\gamma_t\gamma_x\gamma_w+21p_y\gamma_t\gamma_y\gamma_w$$

$$\mathbf{i}\psi_{L1}^{14}\mathbf{i}-\psi_{L4}^{25}=2m+21E\gamma_t-21p_x\gamma_x-21p_y\gamma_y-21p_z\gamma_z-21m\gamma_w+21E\gamma_t\gamma_w-21p_x\gamma_x\gamma_w-21p_y\gamma_y\gamma_w-21p_z\gamma_z\gamma_w+21p_z\gamma_t\gamma_x\gamma_y-21p_y\gamma_t\gamma_x\gamma_z+21p_x\gamma_t\gamma_y\gamma_z$$

$$\mathbf{j}\psi_{L1}^{14}\mathbf{j}+\psi_{L3}^{20}=2E-2m+(2E-2m)\,\gamma_t+21p_x\gamma_x+21p_y\gamma_y+21p_z\gamma_z+(-2E-2m)\,\gamma_w+21p_x\gamma_t\gamma_x+21p_y\gamma_t\gamma_y+21p_z\gamma_x\gamma_y+21p_z\gamma_t\gamma_z-21p_y\gamma_x\gamma_z+21p_x\gamma_y\gamma_z$$

$$\mathbf{k}\psi_{L1}^{14}\mathbf{k}-\psi_{L2}^{7}=-2E+21m\gamma_t-21E\gamma_w+21p_x\gamma_t\gamma_x+21p_y\gamma_t\gamma_y-21p_z\gamma_x\gamma_y+21p_z\gamma_t\gamma_z+21p_y\gamma_x\gamma_z-21p_x\gamma_y\gamma_z-21m\gamma_t\gamma_w+21m\gamma_x\gamma_y\gamma_z+21p_x\gamma_t\gamma_x\gamma_w+21p_y\gamma_t\gamma_y\gamma_w$$

$$\mathbf{i}\psi_{L1}^{15}\mathbf{i}-\psi_{L4}^{28}=-2m-21E\gamma_t+21p_x\gamma_x+21p_y\gamma_y+21p_z\gamma_z-21m\gamma_w+21E\gamma_t\gamma_w-21p_x\gamma_x\gamma_w-21p_y\gamma_y\gamma_w-21p_z\gamma_z\gamma_w+21p_z\gamma_t\gamma_x\gamma_y-21p_y\gamma_t\gamma_x\gamma_z+21p_x\gamma_t\gamma_y\gamma_z$$

$$\mathbf{j}\psi_{L1}^{15}\mathbf{j}+\psi_{L3}^{17}=2m-2E+(2m-2E)\,\gamma_t-21p_x\gamma_x-21p_y\gamma_y-21p_z\gamma_z+(-2E-2m)\,\gamma_w-21p_x\gamma_t\gamma_x-21p_y\gamma_t\gamma_y+21p_z\gamma_x\gamma_y-21p_z\gamma_t\gamma_z-21p_y\gamma_x\gamma_z+21p_x\gamma_y\gamma_z$$

$$\mathbf{k}\psi_{L1}^{15}\mathbf{k}-\psi_{L2}^{6}=2E-21m\gamma_t-21E\gamma_w-21p_x\gamma_t\gamma_x-21p_y\gamma_t\gamma_y-21p_z\gamma_x\gamma_y-21p_z\gamma_t\gamma_z+21p_y\gamma_x\gamma_z-21p_x\gamma_y\gamma_z-21m\gamma_t\gamma_w+21m\gamma_x\gamma_y\gamma_z+21p_x\gamma_t\gamma_x\gamma_w+21p_y\gamma_t\gamma_y\gamma_w$$

$$\mathbf{i}\psi_{L1}^{16}\mathbf{i}-\psi_{L4}^{27}=2m+21E\gamma_t-21p_x\gamma_x-21p_y\gamma_y-21p_z\gamma_z-21m\gamma_w+21E\gamma_t\gamma_w-21p_x\gamma_x\gamma_w-21p_y\gamma_y\gamma_w-21p_z\gamma_z\gamma_w-21p_z\gamma_t\gamma_x\gamma_y+21p_y\gamma_t\gamma_x\gamma_z-21p_x\gamma_t\gamma_y\gamma_z$$

$$\mathbf{j}\psi_{L1}^{16}\mathbf{j}+\psi_{L3}^{18}=2E-2m+(2E-2m)\,\gamma_t+21p_x\gamma_x+21p_y\gamma_y+21p_z\gamma_z+(-2E-2m)\,\gamma_w+21p_x\gamma_t\gamma_x+21p_y\gamma_t\gamma_y-21p_z\gamma_x\gamma_y+21p_z\gamma_t\gamma_z+21p_y\gamma_x\gamma_z-21p_x\gamma_y\gamma_z$$

$$\mathbf{k}\psi_{L1}^{16}\mathbf{k}-\psi_{L2}^{5}=-2E+21m\gamma_t-21E\gamma_w+21p_x\gamma_t\gamma_x+21p_y\gamma_t\gamma_y+21p_z\gamma_x\gamma_y+21p_z\gamma_t\gamma_z-21p_y\gamma_x\gamma_z+21p_x\gamma_y\gamma_z-21m\gamma_t\gamma_w-21m\gamma_x\gamma_y\gamma_z+21p_x\gamma_t\gamma_x\gamma_w+21p_y\gamma_t\gamma_y\gamma_w$$

$$\mathbf{i}\psi_{L1}^{17}\mathbf{i}-\psi_{L4}^{6}=-2m-21E\gamma_t+21p_x\gamma_x+21p_y\gamma_y+21p_z\gamma_z-21m\gamma_w+21E\gamma_t\gamma_w-21p_x\gamma_x\gamma_w-21p_y\gamma_y\gamma_w-21p_z\gamma_z\gamma_w+21p_z\gamma_t\gamma_x\gamma_y-21p_y\gamma_t\gamma_x\gamma_z+21p_x\gamma_t\gamma_y\gamma_z$$

$$\mathbf{j}\psi_{L1}^{17}\mathbf{j}+\psi_{L3}^{15}=2m+2E+(-2E-2m)\,\gamma_t-21p_x\gamma_x-21p_y\gamma_y-21p_z\gamma_z+(2E-2m)\,\gamma_w+21p_x\gamma_t\gamma_x+21p_y\gamma_t\gamma_y-21p_z\gamma_x\gamma_y+21p_z\gamma_t\gamma_z+21p_y\gamma_x\gamma_z-21p_x\gamma_y\gamma_z$$

$$\mathbf{k}\psi_{L1}^{17}\mathbf{k}-\psi_{L2}^{28}=-2E+21m\gamma_t+21E\gamma_w+21p_x\gamma_t\gamma_x+21p_y\gamma_t\gamma_y+21p_z\gamma_x\gamma_y+21p_z\gamma_t\gamma_z-21p_y\gamma_x\gamma_z+21p_x\gamma_y\gamma_z+21m\gamma_t\gamma_w-21m\gamma_x\gamma_y\gamma_z-21p_x\gamma_t\gamma_x\gamma_w-21p_y\gamma_t\gamma_y\gamma_w$$

$$\mathbf{i}\psi_{L1}^{18}\mathbf{i}-\psi_{L4}^{5}=2m+21E\gamma_t-21p_x\gamma_x-21p_y\gamma_y-21p_z\gamma_z-21m\gamma_w+21E\gamma_t\gamma_w-21p_x\gamma_x\gamma_w-21p_y\gamma_y\gamma_w-21p_z\gamma_z\gamma_w-21p_z\gamma_t\gamma_x\gamma_y+21p_y\gamma_t\gamma_x\gamma_z-21p_x\gamma_t\gamma_y\gamma_z$$

$$\mathbf{j}\psi_{L1}^{18}\mathbf{j}+\psi_{L3}^{16}=-2E-2m+(2m+2E)\,\gamma_t+21p_x\gamma_x+21p_y\gamma_y+21p_z\gamma_z+(2E-2m)\,\gamma_w-21p_x\gamma_t\gamma_x-21p_y\gamma_t\gamma_y+21p_z\gamma_x\gamma_y-21p_z\gamma_t\gamma_z-21p_y\gamma_x\gamma_z+21p_x\gamma_y\gamma_z$$

$$\mathbf{k}\psi_{L1}^{18}\mathbf{k}-\psi_{L2}^{27}=2E-21m\gamma_t+21E\gamma_w-21p_x\gamma_t\gamma_x-21p_y\gamma_t\gamma_y-21p_z\gamma_x\gamma_y-21p_z\gamma_t\gamma_z+21p_y\gamma_x\gamma_z-21p_x\gamma_y\gamma_z+21m\gamma_t\gamma_w+21m\gamma_x\gamma_y\gamma_z-21p_x\gamma_t\gamma_x\gamma_w-21p_y\gamma_t\gamma_y\gamma_w$$

$$\mathbf{i}\psi_{L1}^{19}\mathbf{i}-\psi_{L4}^{8}=-2m-21E\gamma_t+21p_x\gamma_x+21p_y\gamma_y+21p_z\gamma_z-21m\gamma_w+21E\gamma_t\gamma_w-21p_x\gamma_x\gamma_w-21p_y\gamma_y\gamma_w-21p_z\gamma_z\gamma_w-21p_z\gamma_t\gamma_x\gamma_y+21p_y\gamma_t\gamma_x\gamma_z-21p_x\gamma_t\gamma_y\gamma_z$$

$$\mathbf{j}\psi_{L1}^{19}\mathbf{j}+\psi_{L3}^{13}=2m+2E+(-2E-2m)\,\gamma_t-21p_x\gamma_x-21p_y\gamma_y-21p_z\gamma_z+(2E-2m)\,\gamma_w+21p_x\gamma_t\gamma_x+21p_y\gamma_t\gamma_y+21p_z\gamma_x\gamma_y+21p_z\gamma_t\gamma_z-21p_y\gamma_x\gamma_z+21p_x\gamma_y\gamma_z$$

$$\mathbf{k}\psi_{L1}^{19}\mathbf{k}-\psi_{L2}^{26}=-2E+21m\gamma_t+21E\gamma_w+21p_x\gamma_t\gamma_x+21p_y\gamma_t\gamma_y-21p_z\gamma_x\gamma_y+21p_z\gamma_t\gamma_z+21p_y\gamma_x\gamma_z-21p_x\gamma_y\gamma_z+21m\gamma_t\gamma_w+21m\gamma_x\gamma_y\gamma_z-21p_x\gamma_t\gamma_x\gamma_w-21p_y\gamma_t\gamma_y\gamma_w$$

$$\mathbf{i}\psi_{L1}^{20}\mathbf{i}-\psi_{L4}^{7}=2m+21E\gamma_t-21p_x\gamma_x-21p_y\gamma_y-21p_z\gamma_z-21m\gamma_w+21E\gamma_t\gamma_w-21p_x\gamma_x\gamma_w-21p_y\gamma_y\gamma_w-21p_z\gamma_z\gamma_w+21p_z\gamma_t\gamma_x\gamma_y-21p_y\gamma_t\gamma_x\gamma_z+21p_x\gamma_t\gamma_y\gamma_z$$

$$\mathbf{j}\psi_{L1}^{20}\mathbf{j}+\psi_{L3}^{14}=-2E-2m+(2m+2E)\,\gamma_t+21p_x\gamma_x+21p_y\gamma_y+21p_z\gamma_z+(2E-2m)\,\gamma_w-21p_x\gamma_t\gamma_x-21p_y\gamma_t\gamma_y-21p_z\gamma_x\gamma_y-21p_z\gamma_t\gamma_z+21p_y\gamma_x\gamma_z-21p_x\gamma_y\gamma_z$$

$$\mathbf{k}\psi_{L1}^{20}\mathbf{k}-\psi_{L2}^{25}=2E-21m\gamma_t+21E\gamma_w-21p_x\gamma_t\gamma_x-21p_y\gamma_t\gamma_y+21p_z\gamma_x\gamma_y-21p_z\gamma_t\gamma_z-21p_y\gamma_x\gamma_z+21p_x\gamma_y\gamma_z+21m\gamma_t\gamma_w-21m\gamma_x\gamma_y\gamma_z-21p_x\gamma_t\gamma_x\gamma_w-21p_y\gamma_t\gamma_y\gamma_w$$

$$\mathbf{i}\psi_{L1}^{21}\mathbf{i}-\psi_{L4}^{2}=-2m-21E\gamma_t+21p_x\gamma_x+21p_y\gamma_y+21p_z\gamma_z-21m\gamma_w+21E\gamma_t\gamma_w-21p_x\gamma_x\gamma_w-21p_y\gamma_y\gamma_w-21p_z\gamma_z\gamma_w-21p_z\gamma_t\gamma_x\gamma_y+21p_y\gamma_t\gamma_x\gamma_z-21p_x\gamma_t\gamma_y\gamma_z$$

$$\mathbf{j}\psi_{L1}^{21}\mathbf{j}+\psi_{L3}^{11}=2m-2E+(2m-2E)\,\gamma_t-21p_x\gamma_x-21p_y\gamma_y-21p_z\gamma_z+(2E-2m)\,\gamma_w-21p_x\gamma_t\gamma_x-21p_y\gamma_t\gamma_y-21p_z\gamma_x\gamma_y-21p_z\gamma_t\gamma_z+21p_y\gamma_x\gamma_z-21p_x\gamma_y\gamma_z$$

$$\mathbf{k}\psi_{L1}^{21}\mathbf{k}-\psi_{L2}^{32}=2E-21m\gamma_t+21E\gamma_w-21p_x\gamma_t\gamma_x-21p_y\gamma_t\gamma_y+21p_z\gamma_x\gamma_y-21p_z\gamma_t\gamma_z-21p_y\gamma_x\gamma_z+21p_x\gamma_y\gamma_z+21m\gamma_t\gamma_w-21m\gamma_x\gamma_y\gamma_z-21p_x\gamma_t\gamma_x\gamma_w-21p_y\gamma_t\gamma_y\gamma_w$$

$\mathbf{i}\psi^{22}_{L1}\mathbf{i}-\psi^{1}_{L4}=2m+21E\gamma_t-21p_x\gamma_x-21p_y\gamma_y-21p_z\gamma_z-21m\gamma_w+21E\gamma_t\gamma_w-21p_x\gamma_x\gamma_w-21p_y\gamma_y\gamma_w-21p_z\gamma_z\gamma_w+21p_z\gamma_t\gamma_x\gamma_y-21p_y\gamma_t\gamma_x\gamma_z+21p_x\gamma_t\gamma_y\gamma_z-21E\gamma_x\gamma_y\gamma_z$

$\mathbf{j}\psi^{22}_{L1}\mathbf{j}+\psi^{12}_{L3}=2E-2m+(2E-2m)\,\gamma_t+21p_x\gamma_x+21p_y\gamma_y+21p_z\gamma_z+(2E-2m)\,\gamma_w+21p_x\gamma_t\gamma_x+21p_y\gamma_t\gamma_y+21p_z\gamma_x\gamma_y+21p_z\gamma_t\gamma_z-21p_y\gamma_x\gamma_z+21p_x\gamma_y\gamma_z+(2m-2E)$

$\mathbf{k}\psi^{22}_{L1}\mathbf{k}-\psi^{31}_{L2}=-2E+21m\gamma_t+21E\gamma_w+21p_x\gamma_t\gamma_x+21p_y\gamma_t\gamma_y-21p_z\gamma_x\gamma_y+21p_z\gamma_t\gamma_z+21p_y\gamma_x\gamma_z-21p_x\gamma_y\gamma_z+21m\gamma_t\gamma_w+21m\gamma_x\gamma_y\gamma_z-21p_x\gamma_t\gamma_x\gamma_w-21p_y\gamma_t\gamma_y\gamma_w+2$

$\mathbf{i}\psi^{23}_{L1}\mathbf{i}-\psi^{4}_{L4}=-2m-21E\gamma_t+21p_x\gamma_x+21p_y\gamma_y+21p_z\gamma_z-21m\gamma_w+21E\gamma_t\gamma_w-21p_x\gamma_x\gamma_w-21p_y\gamma_y\gamma_w-21p_z\gamma_z\gamma_w+21p_z\gamma_t\gamma_x\gamma_y-21p_y\gamma_t\gamma_x\gamma_z+21p_x\gamma_t\gamma_y\gamma_z-21E\gamma_x\gamma_y$

$\mathbf{j}\psi^{23}_{L1}\mathbf{j}+\psi^{9}_{L3}=2m-2E+(2m-2E)\,\gamma_t-21p_x\gamma_x-21p_y\gamma_y-21p_z\gamma_z+(2E-2m)\,\gamma_w-21p_x\gamma_t\gamma_x-21p_y\gamma_t\gamma_y+21p_z\gamma_x\gamma_y-21p_z\gamma_t\gamma_z-21p_y\gamma_x\gamma_z+21p_x\gamma_y\gamma_z+(2m-2E)$

$\mathbf{k}\psi^{23}_{L1}\mathbf{k}-\psi^{30}_{L2}=2E-21m\gamma_t+21E\gamma_w-21p_x\gamma_t\gamma_x-21p_y\gamma_t\gamma_y-21p_z\gamma_x\gamma_y-21p_z\gamma_t\gamma_z+21p_y\gamma_x\gamma_z-21p_x\gamma_y\gamma_z+21m\gamma_t\gamma_w+21m\gamma_x\gamma_y\gamma_z-21p_x\gamma_t\gamma_x\gamma_w-21p_y\gamma_t\gamma_y\gamma_w+21p$

$\mathbf{i}\psi^{24}_{L1}\mathbf{i}-\psi^{3}_{L4}=2m+21E\gamma_t-21p_x\gamma_x-21p_y\gamma_y-21p_z\gamma_z-21m\gamma_w+21E\gamma_t\gamma_w-21p_x\gamma_x\gamma_w-21p_y\gamma_y\gamma_w-21p_z\gamma_z\gamma_w-21p_z\gamma_t\gamma_x\gamma_y+21p_y\gamma_t\gamma_x\gamma_z-21p_x\gamma_t\gamma_y\gamma_z+21E\gamma_x\gamma_y\gamma$

$\mathbf{j}\psi^{24}_{L1}\mathbf{j}+\psi^{10}_{L3}=2E-2m+(2E-2m)\,\gamma_t+21p_x\gamma_x+21p_y\gamma_y+21p_z\gamma_z+(2E-2m)\,\gamma_w+21p_x\gamma_t\gamma_x+21p_y\gamma_t\gamma_y-21p_z\gamma_x\gamma_y+21p_z\gamma_t\gamma_z+21p_y\gamma_x\gamma_z-21p_x\gamma_y\gamma_z+(2m-2E)$

$\mathbf{k}\psi^{24}_{L1}\mathbf{k}-\psi^{29}_{L2}=-2E+21m\gamma_t+21E\gamma_w+21p_x\gamma_t\gamma_x+21p_y\gamma_t\gamma_y+21p_z\gamma_x\gamma_y+21p_z\gamma_t\gamma_z-21p_y\gamma_x\gamma_z+21p_x\gamma_y\gamma_z+21m\gamma_t\gamma_w-21m\gamma_x\gamma_y\gamma_z-21p_x\gamma_t\gamma_x\gamma_w-21p_y\gamma_t\gamma_y\gamma_w+2$

$\mathbf{i}\psi^{25}_{L1}\mathbf{i}-\psi^{14}_{L4}=-2m-21E\gamma_t+21p_x\gamma_x+21p_y\gamma_y+21p_z\gamma_z-21m\gamma_w+21E\gamma_t\gamma_w-21p_x\gamma_x\gamma_w-21p_y\gamma_y\gamma_w-21p_z\gamma_z\gamma_w+21p_z\gamma_t\gamma_x\gamma_y-21p_y\gamma_t\gamma_x\gamma_z+21p_x\gamma_t\gamma_y\gamma_z-21E\gamma_x\gamma$

$\mathbf{j}\psi^{25}_{L1}\mathbf{j}+\psi^{7}_{L3}=2m+2E+(-2E-2m)\,\gamma_t-21p_x\gamma_x-21p_y\gamma_y-21p_z\gamma_z+(2E-2m)\,\gamma_w+21p_x\gamma_t\gamma_x+21p_y\gamma_t\gamma_y-21p_z\gamma_x\gamma_y+21p_z\gamma_t\gamma_z+21p_y\gamma_x\gamma_z-21p_x\gamma_y\gamma_z+(2m-2$

$\mathbf{k}\psi^{25}_{L1}\mathbf{k}-\psi^{20}_{L2}=-2E+21m\gamma_t+21E\gamma_w+21p_x\gamma_t\gamma_x+21p_y\gamma_t\gamma_y+21p_z\gamma_x\gamma_y+21p_z\gamma_t\gamma_z-21p_y\gamma_x\gamma_z+21p_x\gamma_y\gamma_z+21m\gamma_t\gamma_w-21m\gamma_x\gamma_y\gamma_z-21p_x\gamma_t\gamma_x\gamma_w-21p_y\gamma_t\gamma_y\gamma_w-2$

$\mathbf{i}\psi^{26}_{L1}\mathbf{i}-\psi^{13}_{L4}=2m+21E\gamma_t-21p_x\gamma_x-21p_y\gamma_y-21p_z\gamma_z-21m\gamma_w+21E\gamma_t\gamma_w-21p_x\gamma_x\gamma_w-21p_y\gamma_y\gamma_w-21p_z\gamma_z\gamma_w-21p_z\gamma_t\gamma_x\gamma_y+21p_y\gamma_t\gamma_x\gamma_z-21p_x\gamma_t\gamma_y\gamma_z+21E\gamma_x\gamma_y\gamma$

$\mathbf{j}\psi^{26}_{L1}\mathbf{j}+\psi^{8}_{L3}=-2E-2m+(2m+2E)\,\gamma_t+21p_x\gamma_x+21p_y\gamma_y+21p_z\gamma_z+(2E-2m)\,\gamma_w-21p_x\gamma_t\gamma_x-21p_y\gamma_t\gamma_y+21p_z\gamma_x\gamma_y-21p_z\gamma_t\gamma_z-21p_y\gamma_x\gamma_z+21p_x\gamma_y\gamma_z+(2m-2$

$\mathbf{k}\psi^{26}_{L1}\mathbf{k}-\psi^{19}_{L2}=2E-21m\gamma_t+21E\gamma_w-21p_x\gamma_t\gamma_x-21p_y\gamma_t\gamma_y-21p_z\gamma_x\gamma_y-21p_z\gamma_t\gamma_z+21p_y\gamma_x\gamma_z-21p_x\gamma_y\gamma_z+21m\gamma_t\gamma_w+21m\gamma_x\gamma_y\gamma_z-21p_x\gamma_t\gamma_x\gamma_w-21p_y\gamma_t\gamma_y\gamma_w-21p$

$\mathbf{i}\psi^{27}_{L1}\mathbf{i}-\psi^{16}_{L4}=-2m-21E\gamma_t+21p_x\gamma_x+21p_y\gamma_y+21p_z\gamma_z-21m\gamma_w+21E\gamma_t\gamma_w-21p_x\gamma_x\gamma_w-21p_y\gamma_y\gamma_w-21p_z\gamma_z\gamma_w-21p_z\gamma_t\gamma_x\gamma_y+21p_y\gamma_t\gamma_x\gamma_z-21p_x\gamma_t\gamma_y\gamma_z+21E\gamma_x\gamma_y$

$\mathbf{j}\psi^{27}_{L1}\mathbf{j}+\psi^{5}_{L3}=2m+2E+(-2E-2m)\,\gamma_t-21p_x\gamma_x-21p_y\gamma_y-21p_z\gamma_z+(2E-2m)\,\gamma_w+21p_x\gamma_t\gamma_x+21p_y\gamma_t\gamma_y+21p_z\gamma_x\gamma_y+21p_z\gamma_t\gamma_z-21p_y\gamma_x\gamma_z+21p_x\gamma_y\gamma_z+(2m-2$

$\mathbf{k}\psi^{27}_{L1}\mathbf{k}-\psi^{18}_{L2}=-2E+21m\gamma_t+21E\gamma_w+21p_x\gamma_t\gamma_x+21p_y\gamma_t\gamma_y-21p_z\gamma_x\gamma_y+21p_z\gamma_t\gamma_z+21p_y\gamma_x\gamma_z-21p_x\gamma_y\gamma_z+21m\gamma_t\gamma_w+21m\gamma_x\gamma_y\gamma_z-21p_x\gamma_t\gamma_x\gamma_w-21p_y\gamma_t\gamma_y\gamma_w-2$

$\mathbf{i}\psi^{28}_{L1}\mathbf{i}-\psi^{15}_{L4}=2m+21E\gamma_t-21p_x\gamma_x-21p_y\gamma_y-21p_z\gamma_z-21m\gamma_w+21E\gamma_t\gamma_w-21p_x\gamma_x\gamma_w-21p_y\gamma_y\gamma_w-21p_z\gamma_z\gamma_w+21p_z\gamma_t\gamma_x\gamma_y-21p_y\gamma_t\gamma_x\gamma_z+21p_x\gamma_t\gamma_y\gamma_z-21E\gamma_x\gamma_y\gamma$

$\mathbf{j}\psi^{28}_{L1}\mathbf{j}+\psi^{6}_{L3}=-2E-2m+(2m+2E)\,\gamma_t+21p_x\gamma_x+21p_y\gamma_y+21p_z\gamma_z+(2E-2m)\,\gamma_w-21p_x\gamma_t\gamma_x-21p_y\gamma_t\gamma_y-21p_z\gamma_x\gamma_y-21p_z\gamma_t\gamma_z+21p_y\gamma_x\gamma_z-21p_x\gamma_y\gamma_z+(2m-2$

$\mathbf{k}\psi^{28}_{L1}\mathbf{k}-\psi^{17}_{L2}=2E-21m\gamma_t+21E\gamma_w-21p_x\gamma_t\gamma_x-21p_y\gamma_t\gamma_y+21p_z\gamma_x\gamma_y-21p_z\gamma_t\gamma_z-21p_y\gamma_x\gamma_z+21p_x\gamma_y\gamma_z+21m\gamma_t\gamma_w-21m\gamma_x\gamma_y\gamma_z-21p_x\gamma_t\gamma_x\gamma_w-21p_y\gamma_t\gamma_y\gamma_w-21p$

$\mathbf{i}\psi^{29}_{L1}\mathbf{i}-\psi^{10}_{L4}=-2m-21E\gamma_t+21p_x\gamma_x+21p_y\gamma_y+21p_z\gamma_z-21m\gamma_w+21E\gamma_t\gamma_w-21p_x\gamma_x\gamma_w-21p_y\gamma_y\gamma_w-21p_z\gamma_z\gamma_w-21p_z\gamma_t\gamma_x\gamma_y+21p_y\gamma_t\gamma_x\gamma_z-21p_x\gamma_t\gamma_y\gamma_z+21E\gamma_x\gamma_y$

$\mathbf{j}\psi^{29}_{L1}\mathbf{j}+\psi^{3}_{L3}=2m-2E+(2m-2E)\,\gamma_t-21p_x\gamma_x-21p_y\gamma_y-21p_z\gamma_z+(2E-2m)\,\gamma_w-21p_x\gamma_t\gamma_x-21p_y\gamma_t\gamma_y-21p_z\gamma_x\gamma_y-21p_z\gamma_t\gamma_z+21p_y\gamma_x\gamma_z-21p_x\gamma_y\gamma_z+(2m-2E)$

$\mathbf{k}\psi^{29}_{L1}\mathbf{k}-\psi^{24}_{L2}=2E-21m\gamma_t+21E\gamma_w-21p_x\gamma_t\gamma_x-21p_y\gamma_t\gamma_y+21p_z\gamma_x\gamma_y-21p_z\gamma_t\gamma_z-21p_y\gamma_x\gamma_z+21p_x\gamma_y\gamma_z+21m\gamma_t\gamma_w-21m\gamma_x\gamma_y\gamma_z-21p_x\gamma_t\gamma_x\gamma_w-21p_y\gamma_t\gamma_y\gamma_w-21p$

$\mathbf{i}\psi^{30}_{L1}\mathbf{i}-\psi^{9}_{L4}=2m+21E\gamma_t-21p_x\gamma_x-21p_y\gamma_y-21p_z\gamma_z-21m\gamma_w+21E\gamma_t\gamma_w-21p_x\gamma_x\gamma_w-21p_y\gamma_y\gamma_w-21p_z\gamma_z\gamma_w+21p_z\gamma_t\gamma_x\gamma_y-21p_y\gamma_t\gamma_x\gamma_z+21p_x\gamma_t\gamma_y\gamma_z-21E\gamma_x\gamma_y\gamma$

$\mathbf{j}\psi^{30}_{L1}\mathbf{j}+\psi^{4}_{L3}=2E-2m+(2E-2m)\,\gamma_t+21p_x\gamma_x+21p_y\gamma_y+21p_z\gamma_z+(2E-2m)\,\gamma_w+21p_x\gamma_t\gamma_x+21p_y\gamma_t\gamma_y+21p_z\gamma_x\gamma_y+21p_z\gamma_t\gamma_z-21p_y\gamma_x\gamma_z+21p_x\gamma_y\gamma_z+(2m-2E)$

$\mathbf{k}\psi^{30}_{L1}\mathbf{k}-\psi^{23}_{L2}=-2E+21m\gamma_t+21E\gamma_w+21p_x\gamma_t\gamma_x+21p_y\gamma_t\gamma_y-21p_z\gamma_x\gamma_y+21p_z\gamma_t\gamma_z+21p_y\gamma_x\gamma_z-21p_x\gamma_y\gamma_z+21m\gamma_t\gamma_w+21m\gamma_x\gamma_y\gamma_z-21p_x\gamma_t\gamma_x\gamma_w-21p_y\gamma_t\gamma_y\gamma_w-2$

$\mathbf{i}\psi^{31}_{L1}\mathbf{i}-\psi^{12}_{L4}=-2m-21E\gamma_t+21p_x\gamma_x+21p_y\gamma_y+21p_z\gamma_z-21m\gamma_w+21E\gamma_t\gamma_w-21p_x\gamma_x\gamma_w-21p_y\gamma_y\gamma_w-21p_z\gamma_z\gamma_w+21p_z\gamma_t\gamma_x\gamma_y-21p_y\gamma_t\gamma_x\gamma_z+21p_x\gamma_t\gamma_y\gamma_z-21E\gamma_x\gamma_y$

$\mathbf{j}\psi^{31}_{L1}\mathbf{j}+\psi^{1}_{L3}=2m-2E+(2m-2E)\,\gamma_t-21p_x\gamma_x-21p_y\gamma_y-21p_z\gamma_z+(2E-2m)\,\gamma_w-21p_x\gamma_t\gamma_x-21p_y\gamma_t\gamma_y+21p_z\gamma_x\gamma_y-21p_z\gamma_t\gamma_z-21p_y\gamma_x\gamma_z+21p_x\gamma_y\gamma_z+(2m-2E)$

$\mathbf{k}\psi^{31}_{L1}\mathbf{k}-\psi^{22}_{L2}=2E-21m\gamma_t+21E\gamma_w-21p_x\gamma_t\gamma_x-21p_y\gamma_t\gamma_y-21p_z\gamma_x\gamma_y-21p_z\gamma_t\gamma_z+21p_y\gamma_x\gamma_z-21p_x\gamma_y\gamma_z+21m\gamma_t\gamma_w+21m\gamma_x\gamma_y\gamma_z-21p_x\gamma_t\gamma_x\gamma_w-21p_y\gamma_t\gamma_y\gamma_w-21p$

$\mathbf{i}\psi^{32}_{L1}\mathbf{i}-\psi^{11}_{L4}=2m+21E\gamma_t-21p_x\gamma_x-21p_y\gamma_y-21p_z\gamma_z-21m\gamma_w+21E\gamma_t\gamma_w-21p_x\gamma_x\gamma_w-21p_y\gamma_y\gamma_w-21p_z\gamma_z\gamma_w-21p_z\gamma_t\gamma_x\gamma_y+21p_y\gamma_t\gamma_x\gamma_z-21p_x\gamma_t\gamma_y\gamma_z+21E\gamma_x\gamma_y\gamma$

$\mathbf{j}\psi^{32}_{L1}\mathbf{j}+\psi^{2}_{L3}=2E-2m+(2E-2m)\,\gamma_t+21p_x\gamma_x+21p_y\gamma_y+21p_z\gamma_z+(2E-2m)\,\gamma_w+21p_x\gamma_t\gamma_x+21p_y\gamma_t\gamma_y-21p_z\gamma_x\gamma_y+21p_z\gamma_t\gamma_z+21p_y\gamma_x\gamma_z-21p_x\gamma_y\gamma_z+(2m-2E)$

$\mathbf{k}\psi^{32}_{L1}\mathbf{k}-\psi^{21}_{L2}=-2E+21m\gamma_t+21E\gamma_w+21p_x\gamma_t\gamma_x+21p_y\gamma_t\gamma_y+21p_z\gamma_x\gamma_y+21p_z\gamma_t\gamma_z-21p_y\gamma_x\gamma_z+21p_x\gamma_y\gamma_z+21m\gamma_t\gamma_w-21m\gamma_x\gamma_y\gamma_z-21p_x\gamma_t\gamma_x\gamma_w-21p_y\gamma_t\gamma_y\gamma_w-2$