

PSALTer results panel

$$S = \iiint \left( \frac{1}{6} (6 t_{\textcolor{brown}{1}} \mathcal{A}_{\alpha}^{a\textcolor{brown}{1}} \mathcal{A}_{\textcolor{brown}{1}\theta}^{\textcolor{brown}{0}} + 6 \mathcal{A}^{\alpha\beta\chi} \sigma_{\alpha\beta\chi} + 6 f^{\alpha\beta} \tau (\Delta + \mathcal{K})_{\alpha\beta} - 12 t_{\textcolor{brown}{1}} \mathcal{A}_{\alpha}^{\textcolor{brown}{0}} \partial_{\textcolor{brown}{1}} f^{\alpha\textcolor{brown}{1}} + 12 t_{\textcolor{brown}{1}} \mathcal{A}_{\textcolor{brown}{1}\theta}^{\textcolor{brown}{0}} \partial' f_{\alpha}^{\textcolor{brown}{1}} - 6 t_{\textcolor{brown}{1}} \partial_{\textcolor{brown}{1}} f_{\theta}^{\textcolor{brown}{0}} \partial' f_{\alpha}^{\textcolor{brown}{1}} - 6 t_{\textcolor{brown}{1}} \partial_{\textcolor{brown}{1}} f^{\alpha\textcolor{brown}{1}} \partial_{\theta} f_{\alpha}^{\textcolor{brown}{0}} + 12 t_{\textcolor{brown}{1}} \partial' f_{\alpha}^{\textcolor{brown}{1}} \partial_{\theta} f_{\textcolor{brown}{1}}^{\textcolor{brown}{0}} - 8 r_{\textcolor{brown}{1}} \partial_{\beta} \mathcal{A}_{\alpha\textcolor{brown}{1}\theta} \partial^{\theta} \mathcal{A}^{\alpha\beta\textcolor{brown}{1}} + 4 r_{\textcolor{brown}{1}} \partial_{\beta} \mathcal{A}_{\alpha\theta\textcolor{brown}{1}} \partial^{\theta} \mathcal{A}^{\alpha\beta\textcolor{brown}{1}} - \right. \\ \left. 16 r_{\textcolor{brown}{1}} \partial_{\beta} \mathcal{A}_{\textcolor{brown}{1}\theta\alpha} \partial^{\theta} \mathcal{A}^{\alpha\beta\textcolor{brown}{1}} - 4 r_{\textcolor{brown}{1}} \partial_{\textcolor{brown}{1}} \mathcal{A}_{\alpha\beta\theta} \partial^{\theta} \mathcal{A}^{\alpha\beta\textcolor{brown}{1}} + 4 r_{\textcolor{brown}{1}} \partial_{\theta} \mathcal{A}_{\alpha\beta\textcolor{brown}{1}} \partial^{\theta} \mathcal{A}^{\alpha\beta\textcolor{brown}{1}} + 4 r_{\textcolor{brown}{1}} \partial_{\theta} \mathcal{A}_{\alpha\textcolor{brown}{1}\beta} \partial^{\theta} \mathcal{A}^{\alpha\textcolor{brown}{1}}_{\textcolor{brown}{1}} - 6 r_{\textcolor{brown}{5}} \partial_{\textcolor{brown}{1}} \mathcal{A}_{\theta}^{\textcolor{brown}{\kappa}} \partial^{\theta} \mathcal{A}_{\textcolor{brown}{\kappa}}^{\alpha\textcolor{brown}{1}} - 6 r_{\textcolor{brown}{5}} \partial_{\theta} \mathcal{A}_{\textcolor{brown}{\kappa}}^{\textcolor{brown}{\kappa}} \partial^{\theta} \mathcal{A}_{\alpha}^{\alpha\textcolor{brown}{1}} + 4 t_{\textcolor{brown}{1}} \mathcal{A}_{\textcolor{brown}{1}\theta\alpha} \partial^{\theta} f^{\alpha\textcolor{brown}{1}} + 4 t_{\textcolor{brown}{2}} \mathcal{A}_{\textcolor{brown}{1}\theta\alpha} \partial^{\theta} f^{\alpha\textcolor{brown}{1}} - \right. \\ \left. 4 t_{\textcolor{brown}{1}} \partial_{\alpha} f_{\textcolor{brown}{1}\theta} \partial^{\theta} f^{\alpha\textcolor{brown}{1}} + 2 t_{\textcolor{brown}{2}} \partial_{\alpha} f_{\textcolor{brown}{1}\theta} \partial^{\theta} f^{\alpha\textcolor{brown}{1}} - 4 t_{\textcolor{brown}{1}} \partial_{\alpha} f_{\theta\textcolor{brown}{1}} \partial^{\theta} f^{\alpha\textcolor{brown}{1}} - t_{\textcolor{brown}{2}} \partial_{\alpha} f_{\theta\textcolor{brown}{1}} \partial^{\theta} f^{\alpha\textcolor{brown}{1}} + 2 t_{\textcolor{brown}{1}} \partial_{\textcolor{brown}{1}} f_{\alpha\theta} \partial^{\theta} f^{\alpha\textcolor{brown}{1}} - t_{\textcolor{brown}{2}} \partial_{\textcolor{brown}{1}} f_{\alpha\theta} \partial^{\theta} f^{\alpha\textcolor{brown}{1}} + 4 t_{\textcolor{brown}{1}} \partial_{\theta} f_{\alpha\textcolor{brown}{1}} \partial^{\theta} f^{\alpha\textcolor{brown}{1}} + t_{\textcolor{brown}{2}} \partial_{\theta} f_{\alpha\textcolor{brown}{1}} \partial^{\theta} f^{\alpha\textcolor{brown}{1}} + 2 t_{\textcolor{brown}{1}} \partial_{\theta} f_{\textcolor{brown}{1}\alpha} \partial^{\theta} f^{\alpha\textcolor{brown}{1}} - t_{\textcolor{brown}{2}} \partial_{\theta} f_{\textcolor{brown}{1}\alpha} \partial^{\theta} f^{\alpha\textcolor{brown}{1}} + \right. \\ \left. 2 (t_{\textcolor{brown}{1}} + t_{\textcolor{brown}{2}}) \mathcal{A}_{\alpha\textcolor{brown}{1}\theta} (\mathcal{A}^{\alpha\textcolor{brown}{1}\theta} + 2 \partial^{\theta} f^{\alpha\textcolor{brown}{1}}) + 2 \mathcal{A}_{\alpha\theta\textcolor{brown}{1}} ((t_{\textcolor{brown}{1}} - 2 t_{\textcolor{brown}{2}}) \mathcal{A}^{\alpha\textcolor{brown}{1}\theta} + 2 (2 t_{\textcolor{brown}{1}} - t_{\textcolor{brown}{2}}) \partial^{\theta} f^{\alpha\textcolor{brown}{1}}) - 6 r_{\textcolor{brown}{5}} \partial_{\alpha} \mathcal{A}^{\alpha\textcolor{brown}{1}\theta} \partial_{\kappa} \mathcal{A}_{\textcolor{brown}{1}\theta}^{\textcolor{brown}{\kappa}} + 12 r_{\textcolor{brown}{5}} \partial^{\theta} \mathcal{A}_{\alpha}^{\alpha\textcolor{brown}{1}} \partial_{\kappa} \mathcal{A}_{\textcolor{brown}{1}\theta}^{\textcolor{brown}{\kappa}} + 6 r_{\textcolor{brown}{5}} \partial_{\alpha} \mathcal{A}^{\alpha\textcolor{brown}{1}\theta} \partial_{\kappa} \mathcal{A}_{\theta\textcolor{brown}{1}}^{\textcolor{brown}{\kappa}} - 12 r_{\textcolor{brown}{5}} \partial^{\theta} \mathcal{A}_{\alpha}^{\alpha\textcolor{brown}{1}} \partial_{\kappa} \mathcal{A}_{\theta\textcolor{brown}{1}}^{\textcolor{brown}{\kappa}}) [t, x, y, z] dz dy dx dt \right.$$

Wave operator

|                                       | $0^+ \mathcal{A}^{\parallel}$                       | $0^+ f^{\parallel}$                               | $0^+ f^{\perp}$                   | $0^+ \mathcal{A}^{\parallel}$           |   |   |                                   |   |   |                                   |   |  |
|---------------------------------------|---|---|-----------------------------------|---|---|---|-----------------------------------|---|---|-----------------------------------|---|--|
| $0^+ \mathcal{A}^{\parallel} \dagger$ | $-t_1$  | $i \sqrt{2} k t_1$                                | 0                                 | 0                                       |   |   |                                   |   |   |                                   |   |  |
| $0^+ f^{\parallel} \dagger$           | $-i \sqrt{2} k t_1$                                 | $-2 k^2 t_1$                                      | 0                                 | 0                                       |   |   |                                   |   |   |                                   |   |  |
| $0^+ f^{\perp} \dagger$               | 0   | 0   | 0                                 | 0                                       |   |   |                                   |   |   |                                   |   |  |
| $0^+ \mathcal{A}^{\parallel} \dagger$ | 0   | 0   | 0                                 | $t_2$                                   | $1^+ \mathcal{A}^{\parallel}_{\alpha\beta}$ | $1^+ \mathcal{A}^{\perp}_{\alpha\beta}$ | $1^+ f^{\parallel}_{\alpha\beta}$ | $1^+ \mathcal{A}^{\parallel}_{\alpha}$                  | $1^+ \mathcal{A}^{\perp}_{\alpha}$          | $1^+ f^{\parallel}_{\alpha}$      | $1^+ f^{\perp}_{\alpha}$                        |  |
|                                       | $1^+ \mathcal{A}^{\parallel} \dagger^{\alpha\beta}$ | $\frac{1}{6} (6 k^2 (2 r_1 + r_5) + t_1 + 4 t_2)$ | $-\frac{t_1 - 2 t_2}{3 \sqrt{2}}$ | $-\frac{i k (t_1 - 2 t_2)}{3 \sqrt{2}}$ | 0   | 0                                       | 0                                 | 0   |   |                                   |   |  |
|                                       | $1^+ \mathcal{A}^{\perp} \dagger^{\alpha\beta}$     | $-\frac{t_1 - 2 t_2}{3 \sqrt{2}}$                 | $\frac{t_1 + t_2}{3}$             | $\frac{1}{3} i k (t_1 + t_2)$           | 0   | 0                                       | 0                                 | 0   |   |                                   |   |  |
|                                       | $1^+ f^{\parallel} \dagger^{\alpha\beta}$           | $\frac{i k (t_1 - 2 t_2)}{3 \sqrt{2}}$            | $-\frac{1}{3} i k (t_1 + t_2)$    | $\frac{1}{3} k^2 (t_1 + t_2)$           | 0   | 0                                       | 0                                 | 0   |   |                                   |   |  |
|                                       | $1^+ \mathcal{A}^{\parallel} \dagger^{\alpha}$      | 0   | 0                                 | 0                                       | $k^2 (r_1 + r_5) - \frac{t_1}{2}$           | $\frac{t_1}{\sqrt{2}}$                  | 0                                 | $i k t_1$   |   |                                   |   |  |
|                                       | $1^+ \mathcal{A}^{\perp} \dagger^{\alpha}$          | 0   | 0                                 | 0                                       | $\frac{t_1}{\sqrt{2}}$                      | 0                                       | 0                                 | 0   |   |                                   |   |  |
|                                       | $1^+ f^{\parallel} \dagger^{\alpha}$                | 0   | 0                                 | 0                                       | 0   | 0                                       | 0                                 | 0   |   |                                   |   |  |
|                                       | $1^+ f^{\perp} \dagger^{\alpha}$                    | 0   | 0                                 | 0                                       | $-i k t_1$                                  | 0                                       | 0                                 | 0   | $2^+ \mathcal{A}^{\parallel}_{\alpha\beta}$ | $2^+ f^{\parallel}_{\alpha\beta}$ | $2^+ \mathcal{A}^{\parallel}_{\alpha\beta\chi}$ |  |
|                                       |   |   |                                   |   |   |   |                                   | $2^+ \mathcal{A}^{\parallel} \dagger^{\alpha\beta}$     | $\frac{t_1}{2}$                             | $-\frac{i k t_1}{\sqrt{2}}$       | 0   |  |
|                                       |   |   |                                   |   |   |   |                                   | $2^+ f^{\parallel} \dagger^{\alpha\beta}$               | $\frac{i k t_1}{\sqrt{2}}$                  | $k^2 t_1$                         | 0   |  |
|                                       |   |   |                                   |   |   |   |                                   | $2^+ \mathcal{A}^{\parallel} \dagger^{\alpha\beta\chi}$ | 0   | 0                                 | $k^2 r_1 + \frac{t_1}{2}$                       |  |

Saturated propagator

|                                  | $0^+ \sigma^{\parallel}$                                     | $0^+ \tau^{\parallel}$                                      | $0^+ \tau^{\perp}$ | $0^+ \sigma^{\parallel}$             |   |  |   |  |   |  |  |  |   |
|----------------------------------|--|---|--------------------|--------------------------------------|---|--|---|--|---|--|--|--|---|
| $0^+ \sigma^{\parallel} \dagger$ | $-\frac{1}{(1+2 k^2)^2 t_{\textcolor{brown}{1}}}$            | $\frac{i \sqrt{2} k}{(1+2 k^2)^2 t_{\textcolor{brown}{1}}}$ | 0                  | 0                                    |   |  |   |  |   |  |  |  |   |
| $0^+ \tau^{\parallel} \dagger$   | $-\frac{i \sqrt{2} k}{(1+2 k^2)^2 t_{\textcolor{brown}{1}}}$ | $-\frac{2 k^2}{(1+2 k^2)^2 t_{\textcolor{brown}{1}}}$       | 0                  | 0                                    |   |  |   |  |   |  |  |  |   |
| $0^+ \tau^{\perp} \dagger$       | 0  | 0   | 0                  | 0                                    |   |  |   |  |   |  |  |  |   |
| $0^+ \sigma^{\parallel} \dagger$ | 0  | 0   | 0                  | $\frac{1}{t_{\textcolor{brown}{2}}}$ | $1^+ \sigma^{\parallel}_{\alpha\beta}$  | $1^+ \sigma^{\perp}_{\alpha\beta}$   | $1^+ \tau^{\parallel}_{\alpha\beta}$  | $1^+ \sigma^{\parallel}_{\alpha}$  | $1^+ \sigma^{\perp}_{\alpha}$   | $1^+ \tau^{\parallel}_{\alpha}$                    | $1^+ \tau^{\perp}_{\alpha}$  |  |   |
|                                  |  |   |                    |                                      | $1^+ \sigma^{\parallel} \dagger^{\alpha\beta}$  | $1^+ \sigma^{\perp} \dagger^{\alpha\beta}$   | $1^+ \tau^{\parallel} \dagger^{\alpha\beta}$  |  |   |  |  |  |   |
|                                  |  |   |                    |                                      | $\frac{2 (t_{\textcolor{brown}{1}} + t_{\textcolor{brown}{2}})}{3 t_{\textcolor{brown}{1}} t_{\textcolor{brown}{2}} + 2 k^2 (2 r_{\textcolor{brown}{1}} + r_{\textcolor{brown}{5}}) (t_{\textcolor{brown}{1}} + t_{\textcolor{brown}{2}})}$                         | $\frac{\sqrt{2} (t_{\textcolor{brown}{1}} - 2 t_{\textcolor{brown}{2}})}{(1+k^2) (3 t_{\textcolor{brown}{1}} t_{\textcolor{brown}{2}} + 2 k^2 (2 r_{\textcolor{brown}{1}} + r_{\textcolor{brown}{5}}) (t_{\textcolor{brown}{1}} + t_{\textcolor{brown}{2}}))}$   | $\frac{i \sqrt{2} k (t_{\textcolor{brown}{1}} - 2 t_{\textcolor{brown}{2}})}{(1+k^2) (3 t_{\textcolor{brown}{1}} t_{\textcolor{brown}{2}} + 2 k^2 (2 r_{\textcolor{brown}{1}} + r_{\textcolor{brown}{5}}) (t_{\textcolor{brown}{1}} + t_{\textcolor{brown}{2}}))}$  | 0  | 0   | 0  | 0  |  |   |
|                                  |  |   |                    |                                      | $\frac{\sqrt{2} (t_{\textcolor{brown}{1}} - 2 t_{\textcolor{brown}{2}})}{(1+k^2) (3 t_{\textcolor{brown}{1}} t_{\textcolor{brown}{2}} + 2 k^2 (2 r_{\textcolor{brown}{1}} + r_{\textcolor{brown}{5}}) (t_{\textcolor{brown}{1}} + t_{\textcolor{brown}{2}}))}$      | $\frac{6 k^2 (2 r_{\textcolor{brown}{1}} + r_{\textcolor{brown}{5}}) t_{\textcolor{brown}{1}} + 4 t_{\textcolor{brown}{2}}}{(1+k^2)^2 (3 t_{\textcolor{brown}{1}} t_{\textcolor{brown}{2}} + 2 k^2 (2 r_{\textcolor{brown}{1}} + r_{\textcolor{brown}{5}}) (t_{\textcolor{brown}{1}} + t_{\textcolor{brown}{2}}))}$        | $\frac{i k (6 k^2 (2 r_{\textcolor{brown}{1}} + r_{\textcolor{brown}{5}}) t_{\textcolor{brown}{1}} + 4 t_{\textcolor{brown}{2}})}{(1+k^2)^2 (3 t_{\textcolor{brown}{1}} t_{\textcolor{brown}{2}} + 2 k^2 (2 r_{\textcolor{brown}{1}} + r_{\textcolor{brown}{5}}) (t_{\textcolor{brown}{1}} + t_{\textcolor{brown}{2}}))}$ | 0  | 0   | 0  | 0  |  |   |
|                                  |  |   |                    |                                      | $-\frac{i \sqrt{2} k (t_{\textcolor{brown}{1}} - 2 t_{\textcolor{brown}{2}})}{(1+k^2) (3 t_{\textcolor{brown}{1}} t_{\textcolor{brown}{2}} + 2 k^2 (2 r_{\textcolor{brown}{1}} + r_{\textcolor{brown}{5}}) (t_{\textcolor{brown}{1}} + t_{\textcolor{brown}{2}}))}$ | $-\frac{i k (6 k^2 (2 r_{\textcolor{brown}{1}} + r_{\textcolor{brown}{5}}) t_{\textcolor{brown}{1}} + 4 t_{\textcolor{brown}{2}})}{(1+k^2)^2 (3 t_{\textcolor{brown}{1}} t_{\textcolor{brown}{2}} + 2 k^2 (2 r_{\textcolor{brown}{1}} + r_{\textcolor{brown}{5}}) (t_{\textcolor{brown}{1}} + t_{\textcolor{brown}{2}}))}$ | $\frac{k^2 (6 k^2 (2 r_{\textcolor{brown}{1}} + r_{\textcolor{brown}{5}}) t_{\textcolor{brown}{1}} + 4 t_{\textcolor{brown}{2}})}{(1+k^2)^2 (3 t_{\textcolor{brown}{1}} t_{\textcolor{brown}{2}} + 2 k^2 (2 r_{\textcolor{brown}{1}} + r_{\textcolor{brown}{5}}) (t_{\textcolor{brown}{1}} + t_{\textcolor{brown}{2}}))}$ | 0  | 0   | 0  | 0  |  |   |
|                                  |  |   |                    |                                      |   |  |   | 0  | $\frac{\sqrt{2}}{t_{\textcolor{brown}{1}} + 2 k^2 t_{\textcolor{brown}{1}}}$  | 0  | $\frac{2 i k}{t_{\textcolor{brown}{1}} + 2 k^2 t_{\textcolor{brown}{1}}}$  |  |   |
|                                  |  |   |                    |                                      |   |  |   | $\frac{\sqrt{2}}{t_{\textcolor{brown}{1}} + 2 k^2 t_{\textcolor{brown}{1}}}$ | $\frac{-2 k^2 (r_{\textcolor{brown}{1}} + r_{\textcolor{brown}{5}}) + t_{\textcolor{brown}{1}}}{(t_{\textcolor{brown}{1}} + 2 k^2 t_{\textcolor{brown}{1}})^2}$               | 0  | $-\frac{i \sqrt{2} k (2 k^2 (r_{\textcolor{brown}{1}} + r_{\textcolor{brown}{5}}) - t_{\textcolor{brown}{1}})}{(t_{\textcolor{brown}{1}} + 2 k^2 t_{\textcolor{brown}{1}})^2}$ |  |   |
|                                  |  |   |                    |                                      |   |  |   | 0  | 0   | 0  | 0  |  |   |
|                                  |  |   |                    |                                      |   |  |   | $-\frac{2 i k}{t_{\textcolor{brown}{1}} + 2 k^2 t_{\textcolor{brown}{1}}}$   | $\frac{i \sqrt{2} k (2 k^2 (r_{\textcolor{brown}{1}} + r_{\textcolor{brown}{5}}) - t_{\textcolor{brown}{1}})}{(t_{\textcolor{brown}{1}} + 2 k^2 t_{\textcolor{brown}{1}})^2}$ | 0  | $\frac{-4 k^4 (r_{\textcolor{brown}{1}} + r_{\textcolor{brown}{5}}) + 2 k^2 t_{\textcolor{brown}{1}}}{(t_{\textcolor{brown}{1}} + 2 k^2 t_{\textcolor{brown}{1}})^2}$          |  |   |
|                                  |  |   |                    |                                      |   |  |   |  |   | $2^+ \sigma^{\parallel}_{\alpha\beta}$             | $2^+ \tau^{\parallel}_{\alpha\beta}$   | $2^+ \sigma^{\parallel}_{\alpha\beta\chi}$                     |   |
|                                  |  |   |                    |                                      |   |  |   |  |   | $2^+ \sigma^{\parallel} \dagger^{\alpha\beta}$     | $\frac{2}{(1+2 k^2)^2 t_{\textcolor{brown}{1}}}$   | $-\frac{2 i \sqrt{2} k}{(1+2 k^2)^2 t_{\textcolor{brown}{1}}}$ | 0   |
|                                  |  |   |                    |                                      |   |  |   |  |   | $2^+ \tau^{\parallel} \dagger^{\alpha\beta}$       | $\frac{2 i \sqrt{2} k}{(1+2 k^2)^2 t_{\textcolor{brown}{1}}}$  | $\frac{4 k^2}{(1+2 k^2)^2 t_{\textcolor{brown}{1}}}$           | 0   |
|                                  |  |   |                    |                                      |   |  |   |  |   | $2^+ \sigma^{\parallel} \dagger^{\alpha\beta\chi}$ | 0  | 0  | $\frac{2}{2 k^2 r_{\textcolor{brown}{1}} + t_{\textcolor{brown}{1}}}$ |

Source constraints

| Spin-parity form  | Covariant form  | Multiplicities |
|---|---|----------------|
| $0^+ \tau^{\perp} == 0$   | $\partial_{\beta} \partial_{\alpha} \tau (\Delta + \mathcal{K})^{\alpha\beta} == 0$   | 1              |
| $-2 i k 0^+ \sigma^{\parallel} + 0^+ \tau^{\parallel} == 0$                       | $\partial_{\beta} \partial_{\alpha} \tau (\Delta + \mathcal{K})^{\alpha\beta} == \partial_{\beta} \partial^{\beta} \tau (\Delta + \mathcal{K})^{\alpha}_{\alpha} + 2 \partial_{\chi} \partial^{\chi} \partial_{\beta} \sigma^{\alpha}_{\alpha}{}^{\beta}$   | 1              |
| $2 i k 1^+ \sigma^{\perp\alpha} + 1^+ \tau^{\perp\alpha} == 0$                    | $\partial_{\chi} \partial_{\beta} \partial^{\alpha} \tau (\Delta + \mathcal{K})^{\beta\chi} == \partial_{\chi} \partial^{\chi} \partial_{\beta} \tau (\Delta + \mathcal{K})^{\alpha\beta} + 2 \partial_{\delta} \partial^{\delta} \partial_{\chi} \partial_{\beta} \sigma^{\beta\alpha\chi}$  | 3              |
| $1^+ \tau^{\parallel\alpha} == 0$   | $\partial_{\chi} \partial_{\beta} \partial^{\alpha} \tau (\Delta + \mathcal{K})^{\beta\chi} == \partial_{\chi} \partial^{\chi} \partial_{\beta} \tau (\Delta + \mathcal{K})^{\beta\alpha}$  | 3              |
| $i k 1^+ \sigma^{\perp\alpha\beta} + 1^+ \tau^{\perp\alpha\beta} == 0$            | $\partial_{\chi} \partial^{\alpha} \tau (\Delta + \mathcal{K})^{\beta\chi} + \partial_{\chi} \partial^{\beta} \tau (\Delta + \mathcal{K})^{\chi\alpha} + \partial_{\chi} \partial^{\chi} \tau (\Delta + \mathcal{K})^{\alpha\beta} + 2 \partial_{\delta} \partial_{\chi} \partial^{\alpha} \sigma^{\chi\alpha\beta\delta} + 2 \partial_{\delta} \partial^{\delta} \partial_{\chi} \sigma^{\chi\alpha\beta} == \partial_{\chi} \partial^{\alpha} \tau (\Delta + \mathcal{K})^{\chi\beta} + \partial_{\chi} \partial^{\beta} \tau (\Delta + \mathcal{K})^{\alpha\chi} + \partial_{\chi} \partial^{\chi} \tau (\Delta + \mathcal{K})^{\beta\alpha} + 2 \partial_{\delta} \partial_{\chi} \partial^{\beta} \sigma^{\chi\alpha\delta}$   | 3              |
| $-2 i k 2^+ \sigma^{\parallel\alpha\beta} + 2^+ \tau^{\parallel\alpha\beta} == 0$ | $-i (4 \partial_{\delta} \partial_{\chi} \partial^{\beta} \partial^{\alpha} \tau (\Delta + \mathcal{K})^{\chi\delta} + 2 \partial_{\delta} \partial^{\delta} \partial_{\chi} \partial^{\alpha} \tau (\Delta + \mathcal{K})^{\chi}_{\chi} - 3 \partial_{\delta} \partial^{\delta} \partial_{\chi} \partial^{\alpha} \tau (\Delta + \mathcal{K})^{\beta\chi} - 3 \partial_{\delta} \partial^{\delta} \partial_{\chi} \partial^{\alpha} \tau (\Delta + \mathcal{K})^{\chi\beta} - 3 \partial_{\delta} \partial^{\delta} \partial_{\chi} \partial^{\beta} \tau (\Delta + \mathcal{K})^{\alpha\chi} -$<br>$3 \partial_{\delta} \partial^{\delta} \partial_{\chi} \partial^{\beta} \tau (\Delta + \mathcal{K})^{\chi\alpha} + 3 \partial_{\delta} \partial^{\delta} \partial_{\chi} \partial^{\chi} \tau (\Delta + \mathcal{K})^{\alpha\beta} + 3 \partial_{\delta} \partial^{\delta} \partial_{\chi} \partial^{\chi} \tau (\Delta + \mathcal{K})^{\beta\alpha} + 4 i k^{\chi} \partial_{\epsilon} \partial_{\chi} \partial^{\beta} \partial^{\alpha} \sigma^{\delta}_{\delta}{}^{\epsilon} - 6 i k^{\chi} \partial_{\epsilon} \partial_{\delta} \partial_{\chi} \partial^{\alpha} \sigma^{\delta\beta\epsilon} - 6 i k^{\chi} \partial_{\epsilon} \partial_{\delta} \partial_{\chi} \partial^{\beta} \sigma^{\delta\alpha\epsilon} +$<br>$6 i k^{\chi} \partial_{\epsilon} \partial^{\epsilon} \partial_{\delta} \partial_{\chi} \sigma^{\alpha\beta\delta} + 6 i k^{\chi} \partial_{\epsilon} \partial^{\epsilon} \partial_{\delta} \partial_{\chi} \sigma^{\beta\alpha\delta} + 2 \eta^{\alpha\beta} \partial_{\epsilon} \partial^{\epsilon} \partial_{\delta} \partial_{\chi} \tau (\Delta + \mathcal{K})^{\chi\delta} - 2 \eta^{\alpha\beta} \partial_{\epsilon} \partial^{\epsilon} \partial_{\delta} \partial^{\delta} \tau (\Delta + \mathcal{K})^{\chi}_{\chi} - 4 i \eta^{\alpha\beta} k^{\chi} \partial_{\phi} \partial^{\phi} \partial_{\epsilon} \partial_{\chi} \sigma^{\delta}_{\delta}{}^{\epsilon} == 0$ | 5              |
| Total expected gauge generators:  |   | 16             |

Massive spectrum

Massive particle

|               |   |
|---------------|---|
| Pole residue: | $-\frac{3 t_{\textcolor{brown}{1}} t_{\textcolor{brown}{2}} (t_{\textcolor{brown}{1}} + t_{\textcolor{brown}{2}}) + 6 r_{\textcolor{brown}{1}} (t_{\textcolor{brown}{1}}^2 + 2 t_{\textcolor{brown}{2}}^2) + 3 r_{\textcolor{brown}{5}} (t_{\textcolor{brown}{1}}^2 + 2 t_{\textcolor{brown}{2}}^2)}{(2 r_{\textcolor{brown}{1}} + r_{\textcolor{brown}{5}}) (t_{\textcolor{brown}{1}} + t_{\textcolor{brown}{2}}) (-3 t_{\textcolor{brown}{1}} t_{\textcolor{brown}{2}} + 4 r_{\textcolor{brown}{1}} (t_{\textcolor{brown}{1}} + t_{\textcolor{brown}{2}}) + 2 r_{\textcolor{brown}{5}} (t_{\textcolor{brown}{1}} + t_{\textcolor{brown}{2}}))} > 0$ |
| Square mass:  | $-\frac{3 t_{\textcolor{brown}{1}} t_{\textcolor{brown}{2}}}{2 (2 r_{\textcolor{brown}{1}} + r_{\textcolor{brown}{5}}) (t_{\textcolor{brown}{1}} + t_{\textcolor{brown}{2}})} > 0$  |
| Spin:         | 1   |
| Parity:       | Even  |

Massive particle

|               |  |
|---------------|--|
| Pole residue: | $-\frac{1}{r_{\textcolor{brown}{1}}} > 0$                          |
| Square mass:  | $-\frac{t_{\textcolor{brown}{1}}}{2 r_{\textcolor{brown}{1}}} > 0$ |
| Spin:         | 2  |
| Parity:       | Odd  |

Massless spectrum

(No particles)

Unitarity conditions

$$r_{\textcolor{brown}{1}} < 0 \&t_{\textcolor{brown}{2}} < 0 \&t_{\textcolor{brown}{1}} > -t_{\textcolor{brown}{2}} \&r_{\textcolor{brown}{5}} > -2 r_{\textcolor{brown}{1}}$$