

	$\sigma_{1^+ \alpha\beta}^{\#1}$	$\sigma_{1^+ \alpha\beta}^{\#2}$	$\tau_{1^+ \alpha\beta}^{\#1}$	$\sigma_{1^- \alpha}^{\#1}$	$\sigma_{1^- \alpha}^{\#2}$	$\tau_{1^- \alpha}^{\#1}$	$\tau_{1^- \alpha}^{\#2}$
$\sigma_{1^+ \dagger}^{\#1 \alpha\beta}$	$\frac{1}{k^2 (2r_1+r_5)}$	$\frac{1}{\sqrt{2} (k^2+k^4) (2r_1+r_5)}$	$\frac{i}{\sqrt{2} (k+k^3) (2r_1+r_5)}$	0	0	0	0
$\sigma_{1^+ \dagger}^{\#2 \alpha\beta}$	$\frac{1}{\sqrt{2} (k^2+k^4) (2r_1+r_5)}$	$\frac{6k^2 (2r_1+r_5)+t_1}{2 (k+k^3)^2 (2r_1+r_5) t_1}$	$\frac{i (6k^2 (2r_1+r_5)+t_1)}{2k (1+k^2)^2 (2r_1+r_5) t_1}$	0	0	0	0
$\tau_{1^+ \dagger}^{\#1 \alpha\beta}$	$-\frac{i}{\sqrt{2} (k+k^3) (2r_1+r_5)}$	$-\frac{i (6k^2 (2r_1+r_5)+t_1)}{2k (1+k^2)^2 (2r_1+r_5) t_1}$	$\frac{6k^2 (2r_1+r_5)+t_1}{2 (1+k^2)^2 (2r_1+r_5) t_1}$	0	0	0	0
$\sigma_{1^- \dagger}^{\#1 \alpha}$	0	0	0	0	$\frac{\sqrt{2}}{t_1+2k^2 t_1}$	0	$\frac{2ik}{t_1+2k^2 t_1}$
$\sigma_{1^- \dagger}^{\#2 \alpha}$	0	0	0	$\frac{\sqrt{2}}{t_1+2k^2 t_1}$	$\frac{-2k^2 (r_1+r_5)+t_1}{(t_1+2k^2 t_1)^2}$	0	$-\frac{i \sqrt{2} k (2k^2 (r_1+r_5)-t_1)}{(t_1+2k^2 t_1)^2}$
$\tau_{1^- \dagger}^{\#1 \alpha}$	0	0	0	0	0	0	0
$\tau_{1^- \dagger}^{\#2 \alpha}$	0	0	0	$-\frac{2ik}{t_1+2k^2 t_1}$	$\frac{i \sqrt{2} k (2k^2 (r_1+r_5)-t_1)}{(t_1+2k^2 t_1)^2}$	0	$\frac{-4k^4 (r_1+r_5)+2k^2 t_1}{(t_1+2k^2 t_1)^2}$

Lagrangian density

$$\begin{aligned}
& -t_1 \, \omega_{\prime}^{\alpha\prime} \, \omega_{\kappa\alpha}^{\kappa}-\frac{1}{3} t_1 \, \omega_{\prime}^{\kappa\lambda} \, \omega_{\kappa\lambda}^{\prime}+\frac{1}{3} t_1 \, \omega_{\kappa\lambda}^{\prime} \, \omega^{\kappa\lambda}_{\prime} -r_5 \, \partial_{\prime} \omega^{\kappa\lambda}_{\kappa} \, \partial^{\prime} \omega^{\alpha}_{\lambda \alpha} - \\
& \frac{2}{3} r_1 \, \partial^{\beta} \omega^{\theta\alpha}_{\kappa} \, \partial_{\theta} \omega_{\alpha\beta}^{\kappa} -\frac{2}{3} r_1 \, \partial_{\theta} \omega_{\alpha\beta}^{\kappa} \, \partial_{\kappa} \omega^{\alpha\beta\theta} +\frac{2}{3} r_1 \, \partial_{\theta} \omega_{\alpha\beta}^{\kappa} \, \partial_{\kappa} \omega^{\theta\alpha\beta} - \\
& r_5 \, \partial_{\alpha} \omega_{\lambda \theta}^{\alpha} \, \partial_{\kappa} \omega^{\theta\kappa\lambda} +r_5 \, \partial_{\theta} \omega_{\lambda \alpha}^{\alpha} \, \partial_{\kappa} \omega^{\theta\kappa\lambda} -r_5 \, \partial_{\alpha} \omega_{\lambda \theta}^{\alpha} \, \partial_{\kappa} \omega^{\kappa\lambda\theta} + \\
& 2r_5 \, \partial_{\theta} \omega_{\lambda \alpha}^{\alpha} \, \partial_{\kappa} \omega^{\kappa\lambda\theta} -\frac{1}{3} t_1 \, \partial^{\alpha} f_{\theta\kappa} \, \partial^{\kappa} f_{\alpha}^{\theta} -\frac{2}{3} t_1 \, \partial^{\alpha} f_{\kappa\theta} \, \partial^{\kappa} f_{\alpha}^{\theta} - \\
& \frac{1}{3} t_1 \, \partial^{\alpha} f_{\kappa}^{\lambda} \, \partial^{\kappa} f_{\alpha\lambda} +t_1 \, \omega_{\kappa\alpha}^{\alpha} \, \partial^{\kappa} f_{\prime}^{\prime} +t_1 \, \omega_{\kappa\lambda}^{\lambda} \, \partial^{\kappa} f_{\prime}^{\prime} +2t_1 \, \partial^{\alpha} f_{\kappa\alpha} \, \partial^{\kappa} f_{\prime}^{\prime} - \\
& t_1 \, \partial_{\kappa} f_{\lambda}^{\lambda} \, \partial^{\kappa} f_{\prime}^{\prime} +\frac{1}{3} t_1 \, \omega_{\prime\theta\kappa} \, \partial^{\kappa} f^{\prime\theta} +\frac{4}{3} t_1 \, \omega_{\prime\kappa\theta} \, \partial^{\kappa} f^{\prime\theta} -\frac{1}{3} t_1 \, \omega_{\theta\prime\kappa} \, \partial^{\kappa} f^{\prime\theta} + \\
& \frac{2}{3} t_1 \, \omega_{\theta\kappa\prime} \, \partial^{\kappa} f^{\prime\theta} -t_1 \, \omega_{\prime\alpha}^{\alpha} \, \partial^{\kappa} f_{\kappa}^{\prime} -t_1 \, \omega_{\prime\lambda}^{\lambda} \, \partial^{\kappa} f_{\kappa}^{\prime} +\frac{1}{3} t_1 \, \partial^{\alpha} f_{\kappa}^{\lambda} \, \partial^{\kappa} f_{\lambda\alpha} + \\
& \frac{1}{3} t_1 \, \partial_{\kappa} f_{\theta}^{\lambda} \, \partial^{\kappa} f_{\lambda}^{\theta} +\frac{2}{3} t_1 \, \partial_{\kappa} f_{\theta}^{\lambda} \, \partial^{\kappa} f_{\lambda}^{\theta} -t_1 \, \partial^{\alpha} f_{\alpha}^{\lambda} \, \partial^{\kappa} f_{\lambda\kappa} + \\
& \frac{2}{3} r_1 \, \partial_{\kappa} \omega^{\alpha\beta\theta} \, \partial^{\kappa} \omega_{\alpha\beta\theta} -\frac{2}{3} r_1 \, \partial_{\kappa} \omega^{\theta\alpha\beta} \, \partial^{\kappa} \omega_{\alpha\beta\theta} +\frac{2}{3} r_1 \, \partial^{\beta} \omega_{\prime}^{\alpha\lambda} \, \partial_{\lambda} \omega_{\alpha\beta}^{\prime} - \\
& \frac{8}{3} r_1 \, \partial^{\beta} \omega_{\prime}^{\lambda\alpha} \, \partial_{\lambda} \omega_{\alpha\beta}^{\prime} +r_5 \, \partial_{\alpha} \omega_{\lambda \theta}^{\alpha} \, \partial^{\lambda} \omega^{\theta\kappa}_{\kappa} -r_5 \, \partial_{\theta} \omega_{\lambda \alpha}^{\alpha} \, \partial^{\lambda} \omega^{\theta\kappa}_{\kappa}
\end{aligned}$$

$$\text{Added source term: } \Big| f^{\alpha\beta} \, \tau_{\alpha\beta} + \omega^{\alpha\beta\chi} \, \sigma_{\alpha\beta\chi}$$

Source constraints

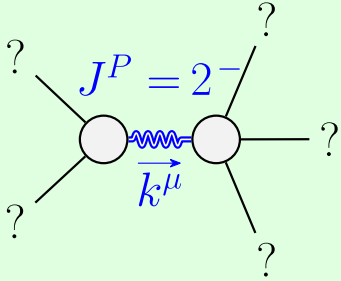
SO(3) irreps	#
$\sigma_0^{\#1} == 0$	1
$\tau_0^{\#2} == 0$	1
$\tau_0^{\#1} - 2 \, i \, k \, \sigma_0^{\#1} == 0$	1
$\tau_1^{\#2 \alpha} + 2 \, i \, k \, \sigma_1^{\#2 \alpha} == 0$	3
$\tau_1^{\#1 \alpha} == 0$	3
$\tau_1^{\#1 \alpha\beta} + i \, k \, \sigma_1^{\#2 \alpha\beta} == 0$	3
$\tau_2^{\#1 \alpha\beta} - 2 \, i \, k \, \sigma_2^{\#1 \alpha\beta} == 0$	5
Total #:	17

	$\omega_{1^+ \alpha\beta}^{\#1}$	$\omega_{1^+ \alpha\beta}^{\#2}$	$f_{1^+ \alpha\beta}^{\#1}$	$\omega_{1^- \alpha}^{\#1}$	$\omega_{1^- \alpha}^{\#2}$	$f_{1^- \alpha}^{\#1}$	$f_{1^- \alpha}^{\#2}$
$\omega_{1^+ \dagger}^{\#1 \alpha\beta}$	$k^2 (2r_1+r_5) + \frac{t_1}{6}$	$-\frac{t_1}{3 \sqrt{2}}$	$-\frac{ik t_1}{3 \sqrt{2}}$	0	0	0	0
$\omega_{1^+ \dagger}^{\#2 \alpha\beta}$	$-\frac{t_1}{3 \sqrt{2}}$	$\frac{t_1}{3}$	$\frac{ik t_1}{3}$	0	0	0	0
$f_{1^+ \dagger}^{\#1 \alpha\beta}$	$\frac{ik t_1}{3 \sqrt{2}}$	$-\frac{1}{3} i k t_1$	$\frac{k^2 t_1}{3}$	0	0	0	0
$\omega_{1^- \dagger}^{\#1 \alpha}$	0	0	0	$k^2 (r_1+r_5) - \frac{t_1}{2}$	$\frac{t_1}{\sqrt{2}}$	0	$i k t_1$
$\omega_{1^- \dagger}^{\#2 \alpha}$	0	0	0	$\frac{t_1}{\sqrt{2}}$	0	0	0
$f_{1^- \dagger}^{\#1 \alpha}$	0	0	0	0	0	0	0
$f_{1^- \dagger}^{\#2 \alpha}$	0	0	0	$-i k t_1$	0	0	0

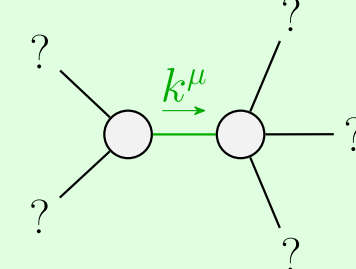
	$\sigma_{2^+ \alpha\beta}^{\#1}$	$\tau_{2^+ \alpha\beta}^{\#1}$	$\sigma_{2^+ \alpha\beta\chi}^{\#1}$
$\sigma_{2^+ \dagger}^{\#1 \alpha\beta}$	$\frac{2}{(1+2k^2)^2 t_1}$	$-\frac{2i \sqrt{2} k}{(1+2k^2)^2 t_1}$	0
$\tau_{2^+ \dagger}^{\#1 \alpha\beta}$	$\frac{2i \sqrt{2} k}{(1+2k^2)^2 t_1}$	$\frac{4k^2}{(1+2k^2)^2 t_1}$	0
$\sigma_{2^- \dagger}^{\#1 \alpha\beta\chi}$	0	0	$\frac{2}{2k^2 r_1+t_1}$

	$\omega_{0^+}^{\#1}$	$f_{0^+}^{\#1}$	$f_{0^+}^{\#2}$	$\omega_{0^-}^{\#1}$
$\omega_{0^+ \dagger}^{\#1}$	$-t_1$	$i \sqrt{2} k t_1$	0	0
$f_{0^+ \dagger}^{\#1}$	$-i \sqrt{2} k t_1$	$-2k^2 t_1$	0	0
$f_{0^+ \dagger}^{\#2}$	0	0	0	0
$\omega_{0^- \dagger}^{\#1}$	0	0	0	0

	$\omega_{2^+ \alpha\beta}^{\#1}$	$f_{2^+ \alpha\beta}^{\#1}$	$\omega_{2^- \alpha\beta\chi}^{\#1}$
$\omega_{2^+ \dagger}^{\#1 \alpha\beta}$	$\frac{t_1}{2}$	$-\frac{ik t_1}{\sqrt{2}}$	0
$f_{2^+ \dagger}^{\#1 \alpha\beta}$	$\frac{ik t_1}{\sqrt{2}}$	$k^2 t_1$	0
$\omega_{2^- \dagger}^{\#1 \alpha\beta\chi}$	0	0	$k^2 r_1 + \frac{t_1}{2}$



Massive particle	
Pole residue:	$-\frac{1}{r_1} > 0$
Polarisations:	5
Square mass:	$-\frac{t_1}{2r_1} > 0$
Spin:	2
Parity:	Odd



Quadratic pole	
Pole residue:	$\frac{1}{(2r_1+r_5)t_1^2 p^2} > 0$
Polarisations:	2

Unitarity conditions

 $r_1 < 0 \ \&\& \ r_5 > -2 \, r_1 \ \&\& \ t_1 > 0$

$\sigma_{0^+}^{\#1}$	$\tau_{0^+}^{\#2}$	$\tau_{0^+}^{\#1}$	$\sigma_{0^+}^{\#1}$
0	0	$-\frac{i \sqrt{2} k}{(1+2k^2)^2 t_1}$	$-\frac{1}{(1+2k^2)^2 t_1}$
0	0	$\frac{i \sqrt{2} k}{(1+2k^2)^2 t_1}$	$\frac{2k^2}{(1+2k^2)^2 t_1}$
0	0	0	0
0	0	0	0