

Massive particle	
Pole residue:	$-\frac{1}{r_2} > 0$
Polarisations:	1
Square mass:	$-\frac{t_2}{r_2} > 0$
Spin:	0
Parity:	Odd

Lagrangian density

$$\begin{aligned}
 &-\frac{1}{3}t_1\omega_{\kappa'}^{\alpha'}\omega_{\kappa\alpha}^{\kappa}+\frac{2}{3}t_3\omega_{\kappa'}^{\alpha'}\omega_{\kappa\alpha}^{\kappa}-\frac{1}{3}t_1\omega_{\kappa'}^{\kappa\lambda}\omega_{\kappa\lambda}^{\kappa'}+\frac{2}{3}t_2\omega_{\kappa'}^{\kappa\lambda}\omega_{\kappa\lambda}^{\kappa'}+ \\
 &\frac{1}{3}t_1\omega_{\kappa\lambda}^{\kappa'}\omega_{\kappa\lambda}^{\kappa\lambda}+\frac{1}{3}t_2\omega_{\kappa'}^{\kappa\lambda}\omega_{\kappa\lambda}^{\kappa'}+\frac{2}{3}r_2\partial^\theta\omega_{\kappa}^{\theta\alpha}\partial_\theta\omega_{\alpha\beta}^{\kappa}- \\
 &\frac{1}{3}r_2\partial_\theta\omega_{\alpha\beta}^{\kappa}\partial_\kappa\omega^{\alpha\beta\theta}-\frac{2}{3}r_2\partial_\theta\omega_{\alpha\beta}^{\kappa}\partial_\kappa\omega^{\theta\alpha\beta}-\frac{1}{3}t_1\partial^\alpha f_{\theta\kappa}\partial^\kappa f_\alpha^\theta+ \\
 &\frac{1}{6}t_2\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}{6}t_2\partial^\alpha f_{\kappa\theta}\partial^\kappa f_\alpha^\theta-\frac{1}{3}t_1\partial^\alpha f_\alpha^\lambda\partial^\kappa f_{\lambda\kappa}^\theta+ \\
 &\frac{1}{6}t_2\partial^\alpha f_\alpha^\lambda\partial^\kappa f_{\lambda\kappa}^\theta+\frac{1}{3}t_1\omega_{\kappa\alpha}^\alpha\partial^\kappa f_{\kappa'}^{\kappa'}-\frac{2}{3}t_3\omega_{\kappa\alpha}^\alpha\partial^\kappa f_{\kappa'}^{\kappa'}+\frac{1}{3}t_1\omega_{\kappa\lambda}^\lambda\partial^\kappa f_{\kappa'}^{\kappa'}- \\
 &\frac{2}{3}t_3\omega_{\kappa\lambda}^\lambda\partial^\kappa f_{\kappa'}^{\kappa'}+\frac{2}{3}t_1\partial^\alpha f_{\kappa\alpha}\partial^\kappa f_{\kappa'}^{\kappa'}-\frac{4}{3}t_3\partial^\alpha f_{\kappa\alpha}\partial^\kappa f_{\kappa'}^{\kappa'}-\frac{1}{3}t_1\partial_\kappa f_\lambda^\lambda\partial^\kappa f_{\kappa'}^{\kappa'}+ \\
 &\frac{2}{3}t_3\partial_\kappa f_\lambda^\lambda\partial^\kappa f_{\kappa'}^{\kappa'}+\frac{1}{3}t_1\omega_{\kappa\theta\kappa}\partial^\kappa f_{\kappa'}^{\kappa'}+\frac{1}{3}t_2\omega_{\kappa\theta\kappa}\partial^\kappa f_{\kappa'}^{\kappa'}+\frac{4}{3}t_1\omega_{\kappa\theta}\partial^\kappa f_{\kappa'}^{\kappa'}- \\
 &\frac{2}{3}t_2\omega_{\kappa\theta}\partial^\kappa f_{\kappa'}^{\kappa'}-\frac{1}{3}t_1\omega_{\theta\kappa\kappa}\partial^\kappa f_{\kappa'}^{\kappa'}-\frac{1}{3}t_2\omega_{\theta\kappa\kappa}\partial^\kappa f_{\kappa'}^{\kappa'}+\frac{2}{3}t_1\omega_{\theta\kappa\kappa'}\partial^\kappa f_{\kappa'}^{\kappa'}+ \\
 &\frac{2}{3}t_2\omega_{\theta\kappa\kappa'}\partial^\kappa f_{\kappa'}^{\kappa'}-\frac{1}{3}t_1\omega_{\kappa'}^\alpha\partial^\kappa f_{\kappa'}^{\kappa'}+\frac{2}{3}t_3\omega_{\kappa'}^\alpha\partial^\kappa f_{\kappa'}^{\kappa'}-\frac{1}{3}t_1\omega_{\kappa'}^\lambda\partial^\kappa f_{\kappa'}^{\kappa'}+ \\
 &\frac{2}{3}t_3\omega_{\kappa'}^\lambda\partial^\kappa f_{\kappa'}^{\kappa'}+\frac{1}{3}t_1\partial^\alpha f_\alpha^\lambda\partial^\kappa f_{\lambda\alpha}^\theta-\frac{1}{6}t_2\partial^\alpha f_\alpha^\lambda\partial^\kappa f_{\lambda\alpha}^\theta+\frac{1}{3}t_1\partial_\kappa f_\theta^\lambda\partial^\kappa f_{\theta\lambda}^\theta- \\
 &\frac{1}{6}t_2\partial_\kappa f_\theta^\lambda\partial^\kappa f_{\theta\lambda}^\theta+\frac{2}{3}t_1\partial_\kappa f_\theta^\lambda\partial^\kappa f_{\theta\lambda}^\theta+\frac{1}{6}t_2\partial_\kappa f_\theta^\lambda\partial^\kappa f_{\theta\lambda}^\theta- \\
 &\frac{1}{3}t_1\partial^\alpha f_\alpha^\lambda\partial_\lambda^\kappa f_\alpha^\kappa+\frac{2}{3}t_3\partial^\alpha f_\alpha^\lambda\partial_\lambda^\kappa f_\alpha^\kappa+\frac{1}{3}r_2\partial_\kappa\omega_{\alpha\beta\theta}\partial^\kappa\omega_{\alpha\beta\theta}+ \\
 &\frac{2}{3}r_2\partial_\kappa\omega_{\alpha\beta\theta}\partial^\kappa\omega_{\alpha\beta\theta}-\frac{2}{3}r_2\partial^\theta\omega_{\kappa'}^{\alpha\lambda}\partial_\lambda\omega_{\alpha\beta}^{\kappa'}+\frac{2}{3}r_2\partial^\theta\omega_{\kappa'}^{\lambda\alpha}\partial_\lambda\omega_{\alpha\beta}^{\kappa'}
 \end{aligned}$$

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

	$\sigma_{0+}^{\#1}$	$\tau_{0+}^{\#1}$	$\tau_{0+}^{\#2}$	$\sigma_0^{\#1}$
$\sigma_{0+}^{\#1} \dagger$	$\frac{1}{(1+2k^2)^2t_3}$	$-\frac{i\sqrt{2}k}{(1+2k^2)^2t_3}$	0	0
$\tau_{0+}^{\#1} \dagger$	$\frac{i\sqrt{2}k}{(1+2k^2)^2t_3}$	$\frac{2k^2}{(1+2k^2)^2t_3}$	0	0
$\tau_{0+}^{\#2} \dagger$	0	0	0	0
$\sigma_0^{\#1} \dagger$	0	0	0	$\frac{1}{k^2r_2+t_2}$

Source constraints	#
SO(3) irreps	1
$\tau_{0+}^{\#2} == 0$	1
$\tau_{0+}^{\#1}-2ik\sigma_{0+}^{\#1} == 0$	3
$\tau_{1-}^{\#2\alpha}+2ik\sigma_{1-}^{\#2\alpha} == 0$	3
$\tau_{1-}^{\#1\alpha} == 0$	3
$\tau_{1+}^{\#1\alpha\beta}+ik\sigma_{1+}^{\#2\alpha\beta} == 0$	5
$\tau_{2+}^{\#1\alpha\beta}-2ik\sigma_{2+}^{\#1\alpha\beta} == 0$	16
Total #:	

	$\omega_{0+}^{\#1}$	$f_{0+}^{\#1}$	$f_{0+}^{\#2}$	$\omega_0^{\#1}$
$\omega_{0+}^{\#1} \dagger$	t_3	$-i\sqrt{2}kt_3$	0	0
$f_{0+}^{\#1} \dagger$	$i\sqrt{2}kt_3$	$2k^2t_3$	0	0
$f_{0+}^{\#2} \dagger$	0	0	0	0
$\omega_0^{\#1} \dagger$	0	0	0	$k^2r_2+t_2$

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

	$\omega_{2+}^{\#1}\alpha\beta$	$f_{2+}^{\#1}\alpha\beta$	$\omega_{2-}^{\#1}\alpha\beta\chi$
$\omega_{2+}^{\#1} \dagger^{\alpha\beta}$	$\frac{t_1}{2}$	$-\frac{ikt_1}{\sqrt{2}}$	0
$f_{2+}^{\#1} \dagger^{\alpha\beta}$	$\frac{ikt_1}{\sqrt{2}}$	k^2t_1	0
$\omega_{2-}^{\#1} \dagger^{\alpha\beta\chi}$	0	0	$\frac{t_1}{2}$

	$\omega_{1+}^{\#1}\alpha\beta$	$\omega_{1+}^{\#2}\alpha\beta$	$f_{1+}^{\#1}\alpha\beta$	$\omega_{1-}^{\#1}\alpha$	$\omega_{1-}^{\#2}\alpha$	$f_{1-}^{\#1}\alpha$	$f_{1-}^{\#2}\alpha$
$\omega_{1+}^{\#1} \dagger^{\alpha\beta}$	$\frac{1}{6}(t_1+4t_2)$	$-\frac{t_1-2t_2}{3\sqrt{2}}$	$-\frac{ik(t_1-2t_2)}{3\sqrt{2}}$	0	0	0	0
$\omega_{1+}^{\#2} \dagger^{\alpha\beta}$	$-\frac{t_1-2t_2}{3\sqrt{2}}$	$\frac{t_1+t_2}{3}$	$\frac{1}{3}ik(t_1+t_2)$	0	0	0	0
$f_{1+}^{\#1} \dagger^{\alpha\beta}$	$\frac{ik(t_1-2t_2)}{3\sqrt{2}}$	$-\frac{1}{3}ik(t_1+t_2)$	$\frac{1}{3}k^2(t_1+t_2)$	0	0	0	0
$\omega_{1-}^{\#1} \dagger^\alpha$	0	0	0	$\frac{1}{6}(t_1+4t_3)$	$\frac{t_1-2t_3}{3\sqrt{2}}$	0	$\frac{1}{3}ik(t_1-2t_3)$
$\omega_{1-}^{\#2} \dagger^\alpha$	0	0	0	$\frac{t_1-2t_3}{3\sqrt{2}}$	$\frac{t_1+t_3}{3}$	0	$\frac{1}{3}i\sqrt{2}k(t_1+t_3)$
$f_{1-}^{\#1} \dagger^\alpha$	0	0	0	0	0	0	0
$f_{1-}^{\#2} \dagger^\alpha$	0	0	0	$-\frac{1}{3}ik(t_1-2t_3)$	$-\frac{1}{3}i\sqrt{2}k(t_1+t_3)$	0	$\frac{2}{3}k^2(t_1+t_3)$

	$\sigma_{1+}^{\#1}\alpha\beta$	$\sigma_{1+}^{\#2}\alpha\beta$	$\tau_{1+}^{\#1}\alpha\beta$	$\sigma_{1-}^{\#1}\alpha$	$\sigma_{1-}^{\#2}\alpha$	$\tau_{1-}^{\#1}\alpha$	$\tau_{1-}^{\#2}\alpha$
$\sigma_{1+}^{\#1} \dagger^{\alpha\beta}$	$\frac{2(t_1+t_2)}{3t_1t_2}$	$\frac{\sqrt{2}(t_1-2t_2)}{3(1+k^2)t_1t_2}$	$\frac{i\sqrt{2}k(t_1-2t_2)}{3(1+k^2)t_1t_2}$	0	0	0	0
$\sigma_{1+}^{\#2} \dagger^{\alpha\beta}$	$\frac{\sqrt{2}(t_1-2t_2)}{3(1+k^2)t_1t_2}$	$\frac{t_1+4t_2}{3(1+k^2)^2t_1t_2}$	$\frac{ik(t_1+4t_2)}{3(1+k^2)^2t_1t_2}$	0	0	0	0
$\tau_{1+}^{\#1} \dagger^{\alpha\beta}$	$-\frac{i\sqrt{2}k(t_1-2t_2)}{3(1+k^2)^2t_1t_2}$	$-\frac{ik(t_1+4t_2)}{3(1+k^2)^2t_1t_2}$	$-\frac{k^2(t_1+4t_2)}{3(1+k^2)^2t_1t_2}$	$\frac{2(t_1+t_3)}{3t_1t_3}$	$-\frac{\sqrt{2}(t_1-2t_3)}{3(1+2k^2)t_1t_3}$	$-\frac{2ik t_1-4ikt_3}{3t_1t_3+6k^2t_1t_3}$	$-\frac{2ik^2k(t_1+4t_3)}{3(1+2k^2)^2t_1t_3}$
$\sigma_{1-}^{\#1} \dagger^\alpha$	0	0	0	0	0	0	0
$\sigma_{1-}^{\#2} \dagger^\alpha$	0	0	0	$-\frac{\sqrt{2}(t_1-2t_3)}{3(1+2k^2)t_1t_3}$	$\frac{t_1+4t_3}{3(1+2k^2)^2t_1t_3}$	$\frac{i\sqrt{2}k(t_1+4t_3)}{3(1+2k^2)^2t_1t_3}$	$\frac{2k^2(t_1+4t_3)}{3(1+2k^2)^2t_1t_3}$
$\tau_{1-}^{\#1} \dagger^\alpha$	0	0	0	0	0	0	0
$\tau_{1-}^{\#2} \dagger^\alpha$	0	0	0	$-\frac{2ik(t_1-2t_3)}{3t_1t_3+6k^2t_1t_3}$	$-\frac{i\sqrt{2}k(t_1+4t_3)}{3(1+2k^2)^2t_1t_3}$	$-\frac{2ik^2(t_1+4t_3)}{3(1+2k^2)^2t_1t_3}$	$-\frac{2k^2(t_1+4t_3)}{3(1+2k^2)^2t_1t_3}$

$r_2 < 0 \ \&\& \ t_2 > 0$

Unitarity conditions

(No massless particles)