



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

$$r_1 < 0 \ \&\& \ t_1 > 0$$

Unitarity conditions

(No massless particles)

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

Lagrangian density

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

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

Source constraints

SO(3) irreps	#
$\tau_{0+}^{\#2} == 0$	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 #:	16

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

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

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