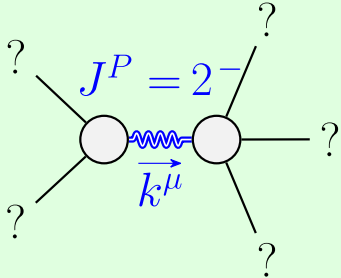


Lagrangian density

$$\begin{aligned} &-\frac{1}{3}t_1\omega_{\kappa\alpha'}\omega_{\kappa\alpha}\omega_{\kappa\lambda}\omega_{\kappa\lambda}'\omega_{\kappa\lambda}'+r_1\partial_{\kappa\lambda}\omega_{\kappa\lambda}'\omega_{\kappa\lambda}^{\alpha}-\frac{2}{3}r_1\partial_{\theta}\omega_{\kappa\lambda}^{\alpha}\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}-3r_1\partial_{\alpha}\omega_{\lambda}^{\alpha}\partial_{\kappa}\omega^{\theta\kappa\lambda}+ \\ &4r_3\partial_{\alpha}\omega_{\lambda}^{\alpha}\partial_{\theta}\omega^{\theta\kappa\lambda}+3r_1\partial_{\theta}\omega_{\lambda}^{\alpha}\partial_{\kappa}\omega^{\theta\kappa\lambda}-4r_3\partial_{\theta}\omega_{\lambda}^{\alpha}\partial_{\kappa}\omega^{\theta\kappa\lambda}+ \\ &r_1\partial_{\alpha}\omega_{\lambda}^{\alpha}\partial_{\theta}\omega^{\kappa\lambda\theta}-2r_1\partial_{\theta}\omega_{\lambda}^{\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_{\lambda}^{\lambda}\partial^{\kappa}f_{\alpha\lambda}'+\frac{1}{3}t_1\omega_{\kappa\alpha}^{\alpha}\partial^{\kappa}f_{\lambda}'+ \\ &\frac{1}{3}t_1\omega_{\kappa\lambda}^{\lambda}\partial^{\kappa}f_{\lambda}'+\frac{2}{3}t_1\partial^{\alpha}f_{\kappa\alpha}\partial^{\kappa}f_{\lambda}^{'}-\frac{1}{3}t_1\partial_{\kappa}f_{\lambda}^{\lambda}\partial^{\kappa}f_{\lambda}^{'},+2t_1\omega_{\kappa\theta}\partial^{\kappa}f^{'\theta}- \\ &\frac{1}{3}t_1\omega_{\lambda\alpha}^{\alpha}\partial^{\kappa}f_{\kappa}^{'}-\frac{1}{3}t_1\omega_{\lambda\lambda}^{\lambda}\partial^{\kappa}f_{\kappa}^{'},+\frac{1}{2}t_1\partial^{\alpha}f_{\lambda}^{\lambda}\partial^{\kappa}f_{\lambda\alpha}'+ \\ &\frac{1}{2}t_1\partial_{\kappa}f_{\theta}^{\lambda}\partial^{\kappa}f_{\lambda}^{\theta}+\frac{1}{2}t_1\partial_{\kappa}f_{\theta}^{\lambda}\partial^{\kappa}f_{\lambda}^{\theta}-\frac{1}{3}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_{\lambda}^{'\alpha\lambda}\partial_{\lambda}\omega_{\alpha\beta}'+ \\ &\frac{4}{3}r_1\partial^{\beta}\omega_{\lambda}^{'\lambda\alpha}\partial_{\lambda}\omega_{\alpha\beta}^{'}-4r_3\partial^{\beta}\omega_{\lambda}^{'\lambda\alpha}\partial_{\lambda}\omega_{\alpha\beta}^{'},+3r_1\partial_{\alpha}\omega_{\lambda}^{\alpha}\partial^{\lambda}\omega_{\theta}^{\theta\kappa}- \\ &4r_3\partial_{\alpha}\omega_{\lambda}^{\alpha}\partial^{\lambda}\omega_{\theta}^{\theta\kappa}-3r_1\partial_{\theta}\omega_{\lambda}^{\alpha}\partial^{\lambda}\omega_{\kappa}^{\theta\kappa}+4r_3\partial_{\theta}\omega_{\lambda}^{\alpha}\partial^{\lambda}\omega_{\kappa}^{\theta\kappa} \end{aligned}$$

Added source term:

$f^{\alpha\beta}\tau_{\alpha\beta}+\omega^{\alpha\beta\chi}\sigma_{\alpha\beta\chi}$



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

$r_1 < 0$

$t_1 \gg 0$

$t_1 > 0$

Unitarity conditions

(No massless particles)

$\sigma_{1+}^{\#1} \dagger^{\alpha\beta}$	$\sigma_{1+}^{\#2} \dagger^{\alpha\beta}$	$\tau_{1+}^{\#1} \dagger^{\alpha\beta}$	$\sigma_{1-}^{\#1} \dagger^{\alpha}$	$\sigma_{1-}^{\#2} \dagger^{\alpha}$	$\tau_{1-}^{\#1} \dagger^{\alpha}$	$\tau_{1-}^{\#2} \dagger^{\alpha}$
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
$-\frac{\sqrt{2}}{t_1+k^2}t_1$	$\frac{-2k^2r_1+t_1}{(1+k^2)^2}t_1^2$	$-\frac{i(2k^3r_1-kt_1)}{(1+k^2)^2}t_1^2$	0	0	0	0
$\frac{i\sqrt{2}k}{t_1+k^2}t_1$	$\frac{i(2k^3r_1-kt_1)}{(1+k^2)^2}t_1^2$	$\frac{-2k^4r_1+k^2t_1}{(1+k^2)^2}t_1^2$	0	0	0	0
0	0	0	$\frac{6}{(3+4k^2)^2}t_1$	$\frac{6\sqrt{2}}{(3+4k^2)^2}t_1$	0	$\frac{12ik}{(3+4k^2)^2}t_1$
0	0	0	0	$\frac{12}{(3+4k^2)^2}t_1$	0	$\frac{12i\sqrt{2}k}{(3+4k^2)^2}t_1$
0	0	0	0	0	0	0
0	0	0	$-\frac{12ik}{(3+4k^2)^2}t_1$	$-\frac{12i\sqrt{2}k}{(3+4k^2)^2}t_1$	0	$\frac{24k^2}{(3+4k^2)^2}t_1$

$\omega_{1+}^{\#1} \dagger^{\alpha\beta}$	$\omega_{1+}^{\#2} \dagger^{\alpha\beta}$	$f_{1+}^{\#1} \dagger^{\alpha\beta}$	$\omega_{1-}^{\#1} \dagger^{\alpha}$	$\omega_{1-}^{\#2} \dagger^{\alpha}$	$f_{1-}^{\#1} \dagger^{\alpha}$	$f_{1-}^{\#2} \dagger^{\alpha}$
$k^2r_1-\frac{t_1}{2}$	$-\frac{t_1}{\sqrt{2}}$	$-\frac{ikt_1}{\sqrt{2}}$	0	0	0	0
$-\frac{t_1}{\sqrt{2}}$	0	0	0	0	0	0
$\frac{ikt_1}{\sqrt{2}}$	0	0	$\frac{t_1}{6}$	$\frac{t_1}{3\sqrt{2}}$	0	$\frac{ikt_1}{3}$
0	0	0	0	$\frac{t_1}{3}$	$\frac{1}{3}i\sqrt{2}kt_1$	0
0	0	0	0	0	0	0
0	0	0	$-\frac{1}{3}ikt_1$	$-\frac{1}{3}i\sqrt{2}kt_1$	0	$\frac{2k^2t_1}{3}$

SO(3) irreps		#
$\tau_{0+}^{\#2} == 0$		1
$\tau_{0+}^{\#1} == 0$		1
$\tau_{1-}^{\#2\alpha} + 2ik\sigma_{1-}^{\#1\alpha} == 0$		3
$\tau_{1-}^{\#1\alpha} == 0$		3
$\sigma_{1-}^{\#1\alpha} == \sigma_{1-}^{\#2\alpha}$		3
$\tau_{1+}^{\#1\alpha\beta} + ik\sigma_{1+}^{\#2\alpha\beta} == 0$		3
$\tau_{2+}^{\#1\alpha\beta} - 2ik\sigma_{2+}^{\#1\alpha\beta} == 0$		5
Total #:		19

$\omega_{0+}^{\#1} \dagger^{\alpha\beta}$	$f_{0+}^{\#1} \dagger^{\alpha\beta}$	$f_{0+}^{\#2} \dagger^{\alpha\beta}$	$\omega_{0-}^{\#1} \dagger^{\alpha\beta\chi}$
$6k^2(-r_1+r_3)$	0	0	0
0	0	0	0
0	0	0	0
0	0	0	$-t_1$

$\omega_{2+}^{\#1} \dagger^{\alpha\beta}$	$f_{2+}^{\#1} \dagger^{\alpha\beta}$	$\omega_{2-}^{\#1} \dagger^{\alpha\beta\chi}$
$\frac{t_1}{2}$	$-\frac{ikt_1}{\sqrt{2}}$	0
$\frac{ikt_1}{\sqrt{2}}$	k^2t_1	0
0	0	$k^2r_1+\frac{t_1}{2}$

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

$\sigma_{0+}^{\#1} \dagger^{\alpha\beta}$	$\tau_{0+}^{\#1} \dagger^{\alpha\beta}$	$\tau_{0+}^{\#2} \dagger^{\alpha\beta}$	$\sigma_{0-}^{\#1} \dagger^{\alpha\beta\chi}$
$\frac{1}{6k^2(-r_1+r_3)}$	0	0	0
0	0	0	0
0	0	0	0
0	0	0	$-\frac{1}{t_1}$