

Massive particle	
Pole residue:	$-\frac{1}{r_2} > 0$
Polarisations:	1
Square mass:	$\frac{t_1}{r_2} > 0$
Spin:	0
Parity:	Odd

$r_2 < 0 \ \&\& \ t_1 < 0$

Unitarity conditions

(No massless particles)

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

Lagrangian density

$$-\frac{1}{3}t_1\omega_{\kappa\alpha}^{\alpha'}\omega_{\kappa\alpha}^{\kappa}-t_1\omega_{\kappa\lambda}^{\kappa}\omega_{\kappa\lambda}^{\lambda'}+\frac{2}{3}r_2\partial^\beta\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}{2}t_1\partial^\alpha f_{\theta\kappa}^{\kappa}f_{\alpha}^{\theta}-\frac{1}{2}t_1\partial^\alpha f_{\kappa\theta}^{\kappa}f_{\alpha}^{\theta}-\frac{1}{2}t_1\partial^\alpha f_{\kappa\theta}^{\theta}-\frac{1}{2}t_1\partial^\alpha f_{\alpha}^{\kappa}f_{\lambda}^{\lambda}+\frac{1}{3}t_1\omega_{\kappa\alpha}^{\alpha}\partial^\kappa f_{\lambda}^{\lambda}+\frac{1}{3}t_1\omega_{\kappa\lambda}^{\lambda}\partial^\kappa f_{\theta}^{\theta}+\frac{2}{3}t_1\partial^\alpha f_{\kappa\alpha}^{\kappa}\partial^\kappa f_{\lambda}^{\lambda}-\frac{1}{3}t_1\partial_\kappa f_{\lambda}^{\lambda}\partial^\kappa f_{\alpha}^{\alpha}+\frac{2}{3}t_1\omega_{\kappa\theta}^{\theta}\partial^\kappa f_{\lambda}^{\lambda}+\frac{1}{3}t_1\omega_{\lambda\kappa}^{\kappa}\partial^\kappa f_{\theta}^{\theta}-\frac{1}{3}t_1\omega_{\lambda\alpha}^{\alpha}\partial^\kappa f_{\kappa}^{\kappa}-\frac{1}{3}t_1\omega_{\lambda\lambda}^{\lambda}\partial^\kappa f_{\kappa}^{\kappa}+\frac{1}{2}t_1\partial^\alpha f_{\kappa}^{\lambda}\partial^\kappa f_{\lambda}^{\alpha}+\frac{1}{2}t_1\partial_\kappa f_{\lambda}^{\lambda}\partial^\kappa f_{\alpha}^{\alpha}+\frac{1}{2}t_1\partial_\kappa f_{\theta}^{\theta}\partial^\kappa f_{\lambda}^{\lambda}-\frac{1}{2}t_1\partial^\alpha f_{\alpha}^{\kappa}f_{\lambda}^{\lambda}+\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^{\theta\alpha\beta}\partial^\kappa\omega_{\alpha\beta\theta}-\frac{2}{3}r_2\partial^\beta\omega_{\alpha\beta}^{\lambda'}\partial_\lambda\omega_{\alpha\beta}^{\lambda'}+\frac{2}{3}r_2\partial^\beta\omega_{\lambda'}^{\lambda\alpha}\partial_\lambda\omega_{\alpha\beta}^{\lambda'}$$

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

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

Source constraints

SO(3) irreps	#
$\tau_{0+}^{\#2} == 0$	1
$\tau_{0+}^{\#1} == 0$	1
$\sigma_{0+}^{\#1} == 0$	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 #:	20

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

$\sigma_{0+}^{\#1} + \dagger$	$\tau_{0+}^{\#1} + \dagger$	$\tau_{0+}^{\#2} + \dagger$	$\sigma_{0-}^{\#1} + \dagger$
$\sigma_{0+}^{\#1} + \dagger$	0	0	0
$\tau_{0+}^{\#1} + \dagger$	0	0	0
$\tau_{0+}^{\#2} + \dagger$	0	0	0
$\sigma_{0-}^{\#1} + \dagger$	0	0	$\frac{1}{k^2r_2-t_1}$

$\omega_{0+}^{\#1} + \dagger$	$f_{0+}^{\#1} + \dagger$	$f_{0+}^{\#2} + \dagger$	$\omega_{0-}^{\#1} + \dagger$
$\omega_{0+}^{\#1} + \dagger$	0	0	0
$f_{0+}^{\#1} + \dagger$	0	0	0
$f_{0+}^{\#2} + \dagger$	0	0	0
$\omega_{0-}^{\#1} + \dagger$	0	0	$k^2r_2-t_1$

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