



Massive particle	
Pole residue:	$-\frac{1}{\tilde{z}_2} > 0$
Polarisations:	1
Square mass:	$-\frac{t_2}{\tilde{z}_2} > 0$
Spin:	0
Parity:	Odd

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

Unitarity conditions

(No massless particles)

Lagrangian density

$$\begin{aligned} &\frac{2}{3}t_2\,\omega_{\lambda'}^{\kappa\lambda}\,\omega_{\kappa\lambda}^{\prime}+\frac{1}{3}t_2\,\omega_{\kappa\lambda}^{\prime}\,\omega_{\kappa\lambda}^{\kappa\lambda}+f^{\alpha\beta}\,\tau_{\alpha\beta}+\omega^{\alpha\beta\chi}\,\sigma_{\alpha\beta\chi}-r_3\partial_{\lambda}\omega^{\kappa\lambda}_{\phantom{\kappa\lambda}\kappa}\,\partial'_{\phantom{\kappa\lambda}\lambda}\omega^{\alpha}_{\phantom{\alpha}\alpha}+\\ &\frac{2}{3}r_2\partial^{\beta}\omega^{\theta\alpha}_{\phantom{\theta\alpha}\kappa}\partial_{\theta}\omega^{\kappa}_{\phantom{\kappa}\alpha\beta}-\frac{1}{3}r_2\partial_{\theta}\omega^{\kappa}_{\phantom{\kappa}\alpha\beta}\partial^{\alpha}\omega^{\beta\theta}_{\phantom{\beta\theta}\kappa}\partial_{\kappa}\omega^{\alpha\beta\theta}-\frac{2}{3}r_2\partial_{\theta}\omega^{\kappa}_{\phantom{\kappa}\alpha\beta}\partial_{\kappa}\omega^{\theta\alpha\beta}+\\ &3r_3\partial_{\alpha}\omega^{\alpha}_{\phantom{\alpha}\lambda\theta}\partial_{\kappa}\omega^{\theta\kappa\lambda}-3r_3\partial_{\theta}\omega^{\alpha}_{\phantom{\alpha}\lambda\theta}\partial_{\kappa}\omega^{\theta\kappa\lambda}-r_3\partial_{\alpha}\omega^{\alpha}_{\phantom{\alpha}\lambda\theta}\partial_{\kappa}\omega^{\kappa\lambda\theta}+\\ &2r_3\partial_{\theta}\omega^{\alpha}_{\phantom{\alpha}\lambda\alpha}\partial_{\kappa}\omega^{\kappa\lambda\theta}+\frac{1}{6}t_2\partial^{\alpha}f_{\theta\kappa}\partial^{\kappa}f^{\theta}_{\phantom{\theta}\alpha}-\frac{1}{6}t_2\partial^{\alpha}f_{\kappa\theta}\partial^{\kappa}f^{\theta}_{\phantom{\theta}\alpha}+\frac{1}{6}t_2\partial^{\alpha}f^{\lambda}_{\phantom{\lambda}\kappa}\partial^{\kappa}f_{\alpha\lambda}+\\ &\frac{1}{3}t_2\,\omega_{\lambda\theta\kappa}\,\partial^{\kappa}f^{\lambda\theta}_{\phantom{\lambda\theta}\kappa}-\frac{2}{3}t_2\,\omega_{\lambda\kappa\theta}\,\partial^{\kappa}f^{\lambda\theta}_{\phantom{\lambda\theta}\kappa}-\frac{1}{3}t_2\,\omega_{\theta\lambda\kappa}\,\partial^{\kappa}f^{\lambda\theta}_{\phantom{\lambda\theta}\kappa}+\frac{2}{3}t_2\,\omega_{\theta\kappa\lambda}\,\partial^{\kappa}f^{\lambda\theta}_{\phantom{\lambda\theta}\kappa}-\\ &\frac{1}{6}t_2\partial^{\alpha}f^{\lambda}_{\phantom{\lambda}\kappa}\partial^{\kappa}f_{\lambda\alpha}-\frac{1}{6}t_2\partial_2\partial^{\kappa}f_{\phantom{\kappa}\theta}\lambda\partial^{\kappa}f^{\theta}_{\phantom{\theta}\lambda}+\frac{1}{6}t_2\partial_{\kappa}f^{\lambda}_{\phantom{\lambda}\theta}\partial^{\kappa}f^{\theta}_{\phantom{\theta}\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\lambda}_{\phantom{\alpha\lambda}\alpha\beta}\partial_{\lambda}\omega^{\prime\alpha\lambda}_{\phantom{\alpha\lambda}\alpha\beta}+\frac{2}{3}r_2\partial^{\beta}\omega^{\lambda\alpha}_{\phantom{\lambda\alpha}\alpha\beta}\partial_{\lambda}\omega^{\prime\alpha\lambda}_{\phantom{\alpha\lambda}\alpha\beta}-\\ &4r_3\partial^{\beta}\omega^{\lambda\alpha}_{\phantom{\lambda\alpha}\alpha\beta}\partial_{\lambda}\omega^{\prime\alpha\lambda}_{\phantom{\alpha\lambda}\alpha\beta}-3r_3\partial_{\alpha}\omega^{\alpha}_{\phantom{\alpha}\lambda\theta}\partial^{\lambda}\omega^{\theta\kappa}_{\phantom{\theta\kappa}\kappa}+3r_3\partial_{\theta}\omega^{\alpha}_{\phantom{\alpha}\lambda\theta}\partial^{\lambda}\omega^{\theta\kappa}_{\phantom{\theta\kappa}\kappa} \end{aligned}$$

$\sigma_{1+}^{\#1} \dagger^{\alpha\beta}$	$\sigma_{1+}^{\#2} \dagger^{\alpha\beta}$	$\tau_{1+}^{\#1} \dagger^{\alpha\beta}$	$\sigma_{1-}^{\#1} \dagger^{\alpha}$	$\sigma_{1-}^{\#2} \dagger^{\alpha}$	$\tau_{1-}^{\#1} \dagger^{\alpha}$	$\tau_{1-}^{\#2} \dagger^{\alpha}$
$\frac{1}{k^2 r_3}$	$-\frac{\sqrt{2}}{k^2 r_3 + k^4 r_3}$	$-\frac{i\sqrt{2}}{k r_3 + k^3 r_3}$	0	0	0	0
$-\frac{\sqrt{2}}{k^2 r_3 + k^4 r_3}$	$\frac{3k^2 r_3 + 2t_2}{(k + k^3)^2 r_3 t_2}$	$\frac{i(3k^2 r_3 + 2t_2)}{k(1 + k^2)^2 r_3 t_2}$	0	0	0	0
$\frac{i\sqrt{2}}{k r_3 + k^3 r_3}$	$-\frac{i(3k^2 r_3 + 2t_2)}{k(1 + k^2)^2 r_3 t_2}$	$\frac{3k^2 r_3 + 2t_2}{(1 + k^2)^2 r_3 t_2}$	0	0	0	0
0	0	0	$\frac{1}{k^2 r_3}$	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0

$\omega_{1+}^{\#1} \dagger^{\alpha\beta}$	$\omega_{1+}^{\#2} \dagger^{\alpha\beta}$	$f_{1+}^{\#1} \dagger^{\alpha\beta}$	$\omega_{1-}^{\#1} \dagger^{\alpha}$	$\omega_{1-}^{\#2} \dagger^{\alpha}$	$f_{1-}^{\#1} \dagger^{\alpha}$	$f_{1-}^{\#2} \dagger^{\alpha}$
$k^2 r_3 + \frac{2t_2}{3}$	$\frac{\sqrt{2} t_2}{3}$	$\frac{1}{3} i \sqrt{2} k t_2$	0	0	0	0
$\frac{\sqrt{2} t_2}{3}$	$\frac{t_2}{3}$	$\frac{i k t_2}{3}$	0	0	0	0
$-\frac{1}{3} i \sqrt{2} k t_2$	$-\frac{1}{3} i k t_2$	$\frac{k^2 t_2}{3}$	0	0	0	0
0	0	0	$k^2 r_3$	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0

Source constraints	
SO(3) irreps	#
$\tau_{0+}^{\#2} == 0$	1
$\tau_{0+}^{\#1} == 0$	1
$\tau_{1-}^{\#2\alpha} == 0$	3
$\tau_{1-}^{\#1\alpha} == 0$	3
$\sigma_{1-}^{\#2\alpha} == 0$	3
$\tau_{1+}^{\#1\alpha\beta} + i k \sigma_{1+}^{\#2\alpha\beta} == 0$	3
$\sigma_{2-}^{\#1\alpha\beta\chi} == 0$	5
$\tau_{2+}^{\#1\alpha\beta} == 0$	5
$\sigma_{2+}^{\#1\alpha\beta} == 0$	5
Total #:	29

	$\sigma_{0+}^{\#1}$	$\tau_{0+}^{\#1}$	$\tau_{0+}^{\#2}$	$\sigma_{0-}^{\#1}$
$\sigma_{0+}^{\#1} \dagger$	$\frac{1}{6 k^2 r_3}$	0	0	0
$\tau_{0+}^{\#1} \dagger$	0	0	0	0
$\tau_{0+}^{\#2} \dagger$	0	0	0	0
$\sigma_{0-}^{\#1} \dagger$	0	0	0	$\frac{1}{k^2 r_2 + t_2}$

$\omega_{0+}^{\#1} \dagger$	$f_{0+}^{\#1} \dagger$	$f_{0+}^{\#2} \dagger$	$\omega_{0-}^{\#1} \dagger$
$6 k^2 r_3$	0	0	0
0	0	0	0
0	0	0	0
0	0	0	$k^2 r_2 + t_2$

$\omega_{2+}^{\#1} \dagger^{\alpha\beta}$	$f_{2+}^{\#1} \dagger^{\alpha\beta}$	$\omega_{2-}^{\#1} \dagger^{\alpha\beta\chi}$
0	0	0
0	0	0
0	0	0

	$\sigma_{2+}^{\#1} \dagger^{\alpha\beta}$	$\tau_{2+}^{\#1} \dagger^{\alpha\beta}$	$\sigma_{2-}^{\#1} \dagger^{\alpha\beta\chi}$
$\sigma_{2+}^{\#1} \dagger^{\alpha\beta}$	0	0	0
$\tau_{2+}^{\#1} \dagger^{\alpha\beta}$	0	0	0
$\sigma_{2-}^{\#1} \dagger^{\alpha\beta\chi}$	0	0	0