Table 1

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

Table 2

	$\omega_{1^+}^{\#1}\dagger^{\alpha\beta}$	$\omega_{1^+}^{\#2}\dagger^{\alpha\beta}$	$f_{1^+}^{\#1}\dagger^{\alpha\beta}$	$\omega_{1^-}^{\#1}\dagger^{\alpha}$	$\omega_{1^-}^{\#2}\dagger^{\alpha}$	$f_{1^-}^{\#1}\dagger^{\alpha}$	$f_{1^-}^{\#2}\dagger^{\alpha}$
$f_{1^-}^{\#2}{}_\alpha$	0	0	0	$-\frac{2}{3}ikt_3$	$\frac{1}{3}i\sqrt{2}kt_3$	0	$\frac{2k^2 t_3}{3}$
$f_{1^-}^{\#1}{}_\alpha$	0	0	0	0	0	0	0
$\omega_{1^-}^{\#2}{}_\alpha$	0	0	0	$-\frac{\sqrt{2}t_3}{3}$	$\frac{t_3}{3}$	0	$-\frac{1}{3}i\sqrt{2}kt_3$
$\omega_{1^-}^{\#1}{}_\alpha$	0	0	0	$\frac{2t_3}{3}$	$-\frac{\sqrt{2}t_3}{3}$	0	$\frac{2ikt_3}{3}$
$f_{1^+}^{\#1}{}_{\alpha\beta}$	$\frac{1}{3}i\sqrt{2}kt_2$	$\frac{ikt_2}{3}$	$\frac{k^2 t_2}{3}$	0	0	0	0
$\omega_{1^+}^{\#2}{}_{\alpha\beta}$	$\frac{\sqrt{2}t_2}{3}$	$\frac{t_2}{3}$	$-\frac{1}{3}ikt_2$	0	0	0	0
$\omega_{1^+}^{\#1}{}_{\alpha\beta}$	$\frac{2t_2}{3}$	$\frac{\sqrt{2}t_2}{3}$	$-\frac{1}{3}i\sqrt{2}kt_2$	0	0	0	0

Lagrangian density

$$\frac{2}{3}t_3\,\omega_i{}^{\alpha I}\omega_{\kappa\alpha}{}^\kappa + \frac{2}{3}t_2\,\omega_i{}^{\kappa\lambda}\omega_{\kappa\lambda}{}^I + \frac{1}{3}t_2\,\omega_{\kappa\lambda}{}^I\omega^{\kappa\lambda}{}_I +$$
$$f^{\alpha\beta}\tau_{\alpha\beta} + \omega^{\alpha\beta\chi}\sigma_{\alpha\beta\chi} + \frac{2}{3}r_2\,\partial_\theta\omega_{\alpha\beta}{}^\theta{}^\alpha\,\partial_\kappa\omega_{\alpha\beta}{}^\kappa - \frac{1}{3}r_2\,\partial_\theta\omega_{\alpha\beta}{}^\kappa\,\partial_\kappa\omega^{\alpha\beta\theta} -$$
$$\frac{2}{3}r_2\,\partial_\theta\omega_{\alpha\beta}{}^\kappa\,\partial_\kappa\omega^{\theta\alpha\beta} + \frac{1}{6}t_2\,\partial_\alpha f_{\theta\kappa}\partial^\kappa f_{\alpha}{}^\theta - \frac{1}{6}t_2\,\partial^\alpha f_{\kappa\theta}\partial^\kappa f_{\alpha}{}^\theta + \frac{1}{6}t_2\,\partial^\alpha f^\lambda{}_\kappa\partial^\kappa f_{\alpha\lambda} -$$
$$\frac{2}{3}t_3\,\omega_{\kappa\alpha}{}^\alpha\partial^\kappa f^I{}_I - \frac{2}{3}t_3\,\omega_{\kappa\lambda}{}^\lambda\partial^\kappa f^I{}_I + \frac{2}{3}t_3\,\partial^\alpha f_{\kappa\alpha}\partial^\kappa f^I{}_I + \frac{2}{3}t_3\,\partial_\kappa f^\lambda{}_\lambda\partial^\kappa f^I{}_I +$$
$$\frac{1}{3}t_2\,\omega_{\iota\kappa\theta}\partial^\kappa f^{\iota\theta} - \frac{1}{3}t_2\,\omega_{\iota\kappa\theta}\partial^\kappa f^{\iota\theta} + \frac{1}{3}t_2\,\omega_{\theta\kappa\iota}\partial^\kappa f^{\iota\theta} +$$
$$\frac{2}{3}t_3\,\omega_{\iota\alpha}{}^\alpha\partial^\kappa f^I{}_\kappa + \frac{2}{3}t_3\,\omega_{\iota\lambda}{}^\lambda\partial^\kappa f^I{}_\kappa - \frac{1}{6}t_2\,\partial^\alpha f^\lambda{}_\kappa\partial^\kappa f_{\lambda\alpha} - \frac{1}{6}t_2\,\partial_\kappa f^\lambda{}_\theta\partial^\kappa f_\lambda{}^\theta +$$
$$\frac{1}{6}t_2\,\partial_\kappa f_{\theta}{}^\lambda\partial^\kappa f_{\lambda}{}^\theta + \frac{2}{3}t_3\,\partial^\alpha f^\lambda{}_\lambda\partial^\kappa f_{\lambda\kappa} + \frac{1}{3}r_2\,\partial_\kappa\omega^{\alpha\beta\theta}\partial^\kappa\omega_{\alpha\beta\theta} +$$
$$\frac{2}{3}\partial_\kappa\omega^{\theta\alpha\beta}\partial^\kappa\omega_{\alpha\beta\theta} - \frac{2}{3}r_2\,\partial^\alpha\omega_i{}^{\alpha\lambda}\partial_\lambda\omega_{\alpha\beta I}{}^\prime + \frac{2}{3}r_2\,\partial^\beta\omega_i{}^{\lambda\alpha}\partial_\lambda\omega_{\alpha\beta I}{}^\prime$$

Source constraints

SO(3) irreps	#
$\tau_{0^+}^{\#2} == 0$	1
$\tau_{0^+}^{\#1} - 2ik\,\sigma_{0^+}^{\#1} == 0$	1
$\tau_{1^-}^{\#2\,\alpha} - ik\,\sigma_{1^-}^{\#1\,\alpha} == 0$	3
$\tau_{1^-}^{\#1\,\alpha} == 0$	3
$\sigma_{1^-}^{\#1\,\alpha} + 2\,\sigma_{1^-}^{\#2\,\alpha} == 0$	3
$\tau_{1^+}^{\#1\,\alpha\beta} + ik\,\sigma_{1^+}^{\#1\,\alpha\beta} == 0$	3
$\sigma_{1^+}^{\#1\,\alpha\beta} == \sigma_{1^+}^{\#2\,\alpha\beta}$	3
$\sigma_{2^-}^{\#1\,\alpha\beta\chi} == 0$	5
$\tau_{2^+}^{\#1\,\alpha\beta} == 0$	5
$\sigma_{2^+}^{\#1\,\alpha\beta} == 0$	5
Total #:	32

Table (2+)

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

Table (0)

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

Table (0 inverse)

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

Table (2+ inverse)

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

Massive particle

$J^P = 0^-$

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

(No massless particles)

Unitarity conditions

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