Lagrangian density

$$-\tfrac13 t_1\,\omega_i{}^{\alpha I}\,\omega_{\kappa\alpha}{}^{\kappa} - t_1\,\omega_i{}^{\kappa I}\,\omega_{\kappa\lambda}{}^{\lambda} + f^{\alpha\beta}\,\tau_{\alpha\beta} + \omega^{\alpha\beta\chi}\,\sigma_{\alpha\beta\chi} + \tfrac23 r_2\,\partial^{\beta}\omega^{\theta\alpha}{}_{\theta}\,\partial_{\kappa}\omega_{\alpha\beta}{}^{\kappa} -$$
$$\tfrac13 r_2\,\partial_{\theta}\omega_{\alpha\beta}{}^{\kappa}\,\partial_{\kappa}\omega^{\alpha\beta\theta} - \tfrac23 r_2\,\partial_{\theta}\omega_{\alpha\beta}{}^{\kappa}\,\partial_{\kappa}\omega^{\theta\alpha\beta} + 4 r_3\,\partial_{\alpha}\omega_{\lambda}{}^{\alpha}{}_{\theta}\,\partial_{\kappa}\omega^{\theta\kappa\lambda} -$$
$$4 r_3\,\partial_{\theta}\omega_{\lambda}{}^{\alpha}{}_{\alpha}\,\partial_{\kappa}\omega^{\theta\kappa\lambda} - \tfrac12 t_1\,\partial^{\alpha}f_{\theta\kappa}\,\partial^{\kappa}f^{\theta}{}_{\alpha} - \tfrac12 t_1\,\partial^{\alpha}f_{\kappa\theta}\,\partial^{\kappa}f^{\theta}{}_{\alpha} +$$
$$\tfrac13 t_1\,\omega_{\kappa\alpha}{}^{\alpha}\partial^{\kappa}f^{I}{}_{I} + \tfrac13 t_1\,\omega_{\kappa\lambda}{}^{\lambda}\,\partial^{\kappa}f^{I}{}_{I} + \tfrac23 t_1\,\partial_{\kappa}f_{\kappa\alpha}\,\partial^{\kappa}f^{I}{}_{I} - \tfrac13 t_1\,\partial_{\kappa}f^{\lambda}{}_{\lambda}\,\partial^{\kappa}f_{I\alpha} +$$
$$2 t_1\,\omega_{I\kappa\theta}\,\partial^{\kappa}f^{I\theta} - \tfrac13 t_1\,\omega_{I\alpha}{}^{\alpha}\partial^{\kappa}f^{I}{}_{\kappa} - \tfrac13 t_1\,\omega_{I\alpha}{}^{\lambda}{}_{\lambda}\partial^{\kappa}f^{I}{}_{\kappa} + \tfrac13 t_1\,\partial^{\alpha}f^{I}{}_{\kappa}\,\partial^{\kappa}f_{\lambda\alpha} +$$
$$\tfrac12 t_1\,\partial_{\kappa}f_{\theta}{}^{\lambda}\,\partial^{\kappa}f_{\lambda}{}^{\theta} + \tfrac12 t_1\,\partial_{\kappa}f_{\lambda}{}^{\theta}\,\partial^{\kappa}f^{\lambda}{}_{\theta} - \tfrac13 t_1\,\partial^{\alpha}f^{\lambda}{}_{\alpha}\,\partial^{\kappa}f_{\lambda\kappa} + \tfrac12 r_2\,\partial_{\kappa}\omega_{\alpha\beta\theta}\,\partial^{\kappa}\omega_{\alpha\beta\theta} +$$
$$\tfrac23 r_2\,\partial_{\kappa}\omega^{\theta\alpha\beta}\,\partial_{\theta}\omega_{\alpha\beta}{}^{\kappa} - \tfrac23 r_2\,\partial^{\beta}\omega_{i}{}^{\lambda\alpha}\,\partial_{\lambda}\omega_{\alpha\beta}{}^{i} + \tfrac23 r_2\,\partial^{\beta}\omega_{i}{}^{\lambda\alpha}\,\partial_{\lambda}\omega_{\alpha\beta}{}^{i} -$$
$$4 r_3\,\partial^{\beta}\omega_{i}{}^{\lambda\alpha}\,\partial_{\lambda}\omega_{\alpha\beta}{}^{i} - 4 r_3\,\partial_{\alpha}\omega_{\lambda}{}^{\alpha}{}_{\theta}\,\partial^{\lambda}\omega^{\theta\kappa}{}_{\kappa} + 4 r_3\,\partial_{\theta}\omega_{\lambda}{}^{\alpha}{}_{\alpha}\,\partial^{\lambda}\omega^{\theta\kappa}{}_{\kappa}$$

Table (1^+ / 1^- sector)

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

Table (f / ω sector)

	$\omega_{1^+}^{\#1}{}^{\dagger\,\alpha\beta}$	$\omega_{1^+}^{\#2}{}^{\dagger\,\alpha\beta}$	$f_{1^+}^{\#1}{}^{\dagger\,\alpha\beta}$	$\omega_{1^-}^{\#1}{}^{\dagger\,\alpha}$	$\omega_{1^-}^{\#2}{}^{\dagger\,\alpha}$	$f_{1^-}^{\#1}{}^{\dagger\,\alpha}$	$f_{1^-}^{\#2}{}^{\dagger\,\alpha}$
$f_{1^-}^{\#2\,\alpha}$	0	0	0	$\frac{i\,k\,t_1}{3}$	$\frac13 i\,\sqrt{2}\,k\,t_1$	0	$\frac{2\,k^2\,t_1}{3}$
$f_{1^-}^{\#1\,\alpha}$	0	0	0	0	0	0	0
$\omega_{1^-}^{\#2\,\alpha}$	0	0	0	$\frac{t_1}{3\,\sqrt{2}}$	$\frac{t_1}{3}$	0	$\frac13 i\,\sqrt{2}\,k\,t_1$
$\omega_{1^-}^{\#1\,\alpha}$	0	0	0	$\frac{t_1}{6}$	$\frac{t_1}{3\,\sqrt{2}}$	0	$-\frac13 i\,k\,t_1$
$f_{1^+}^{\#1\,\alpha\beta}$	0	$-\frac{i\,k\,t_1}{\sqrt{2}}$	0	0	0	0	0
$\omega_{1^+}^{\#2\,\alpha\beta}$	$-\frac{t_1}{\sqrt{2}}$	$-\frac{t_1}{\sqrt{2}}$	0	0	0	0	0
$\omega_{1^+}^{\#1\,\alpha\beta}$	$-\frac{t_1}{2}$	$-\frac{t_1}{\sqrt{2}}$	$\frac{i\,k\,t_1}{\sqrt{2}}$	0	0	0	0

Table (0^+ / 0^- sector)

	$\sigma_{0^+}^{\#1}$	$\tau_{0^+}^{\#1}$	$\tau_{0^+}^{\#2}$	$\sigma_{0^-}^{\#1}$
$\sigma_{0^+}^{\#1}{}^{\dagger}$	$\frac{1}{6\,k^2\,r_3}$	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	$\frac{1}{k^2\,r_2-t_1}$

Table (2^+ / 2^- ω sector)

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

Table (0^+ / 0^- ω sector)

	$\omega_{0^+}^{\#1}{}^{\dagger\,\alpha\beta}$	$f_{0^+}^{\#1}{}^{\dagger}$	$f_{0^+}^{\#2}{}^{\dagger}$	$\omega_{0^-}^{\#1}{}^{\dagger\,\alpha\beta\chi}$
$\omega_{0^+}^{\#1\,\alpha\beta}$	0	0	0	$k^2\,r_2-t_1$
$f_{0^+}^{\#1}$	0	0	0	0
$f_{0^+}^{\#2}$	0	0	0	0
$\omega_{0^-}^{\#1}$	$6\,k^2\,r_3$	0	0	0

Table (2^+ / 2^- σ sector)

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

Source constraints

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

Massive particle

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

$J^P = 0^-$

(No massless particles)

Unitarity conditions

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