Lagrangian density

$$
\begin{aligned}
&-\tfrac{1}{3}t_1\,\omega_i{}^{\alpha i}\,\omega_{\kappa\alpha}{}^{\kappa} - \tfrac{1}{3}t_1\,\omega_i{}^{\kappa\lambda}\,\omega_{\kappa\lambda}{}^{i} + \tfrac{2}{3}t_2\,\omega_i{}^{\kappa\lambda}\,\omega_{\kappa\lambda}{}^{i} + \tfrac{1}{3}t_1\,\omega_{\kappa\lambda}{}^{i}\,\omega^{\kappa\lambda}{}_{i} + \\
&-\tfrac{1}{3}t_2\,\omega_{\kappa\lambda}{}^{i}\,\omega^{\kappa\lambda}{}_{i} + \tfrac{2}{3}r_2\,\partial^{\beta}\omega^{\theta\alpha}{}_{\kappa}\,\partial_{\theta}\omega_{\alpha\beta}{}^{\kappa} - \tfrac{1}{3}r_2\,\partial_{\theta}\omega_{\alpha\beta}{}^{\kappa}\,\partial_{\kappa}\omega^{\theta\alpha\beta} - \\
&\tfrac{2}{3}r_2\,\partial_{\theta}\omega_{\alpha\beta}{}^{\kappa}\,\partial_{\kappa}\omega^{\theta\alpha\beta} + 4r_3\,\partial_{\alpha}\omega_{\lambda}{}^{\alpha}{}_{\theta}\,\partial_{\kappa}\omega^{\theta\kappa\lambda} - 4r_3\,\partial_{\theta}\omega_{\lambda}{}^{\alpha}{}_{\alpha}\,\partial_{\kappa}\omega^{\theta\kappa\lambda} - \\
&\tfrac{1}{3}t_1\,\partial^{\alpha}f_{\theta\kappa}\,\partial^{\kappa}f_{\alpha}{}^{\theta} + \tfrac{1}{6}t_2\,\partial^{\alpha}f_{\theta\kappa}\,\partial^{\kappa}f_{\alpha}{}^{\theta} - \tfrac{2}{3}t_1\,\partial^{\alpha}f_{\kappa\theta}\,\partial^{\kappa}f_{\alpha}{}^{\theta} + \\
&\tfrac{1}{6}t_2\,\partial^{\alpha}f_{\kappa\theta}\,\partial^{\kappa}f_{\alpha}{}^{\theta} - \tfrac{1}{3}t_1\,\partial^{\alpha}f_{\kappa\theta}\,\partial^{\kappa}f_{\alpha}{}^{\theta} + \tfrac{1}{6}t_2\,\partial^{\alpha}f_{\kappa\theta}\,\partial^{\kappa}f_{\alpha\lambda} + \\
&\tfrac{1}{3}t_1\,\omega_{\kappa\alpha}{}^{\lambda}\,\partial^{\kappa}f_{\lambda}{}' + \tfrac{1}{3}t_1\,\omega_{\kappa\lambda}{}^{\lambda}\,\partial^{\kappa}f' + \tfrac{2}{3}t_1\,\partial_{\kappa}f_{\lambda}{}^{\lambda}\,\partial^{\kappa}f' - \tfrac{1}{3}t_1\,\partial_{\kappa}f_{\lambda}{}^{\lambda}\,\partial^{\kappa}f' + \\
&\tfrac{1}{3}t_1\,\omega_{\theta\kappa}\,\partial^{\kappa}f^{\prime\theta} + \tfrac{4}{3}t_1\,\omega_{i\kappa\theta}\,\partial^{\kappa}f^{\prime\theta} - \tfrac{2}{3}t_2\,\omega_{i\kappa\theta}\,\partial^{\kappa}f^{\prime\theta} + \\
&\tfrac{1}{3}t_1\,\omega_{\theta i\kappa}\,\partial^{\kappa}f^{\prime\theta} - \tfrac{1}{3}t_2\,\omega_{\theta i\kappa}\,\partial^{\kappa}f^{\prime\theta} + \tfrac{2}{3}t_2\,\omega_{\theta i\kappa}\,\partial^{\kappa}f_{\lambda\alpha} - \tfrac{1}{3}t_2\,\partial^{\alpha}f_{\kappa}{}^{\kappa}\,\partial^{\kappa}f_{\lambda\alpha} + \\
&\tfrac{1}{3}t_1\,\omega_{i\alpha}{}^{\alpha}\,\partial^{\kappa}f_{\kappa}{}' - \tfrac{1}{3}t_1\,\omega_{i\lambda}{}^{\lambda}\,\partial^{\kappa}f' + \tfrac{1}{3}t_1\,\partial^{\alpha}f_{\kappa}{}^{\kappa}\,\partial^{\kappa}f_{\lambda\alpha} - \tfrac{1}{6}t_2\,\partial^{\alpha}f_{\kappa}{}^{\kappa}\,\partial^{\kappa}f_{\lambda} + \\
&\tfrac{1}{3}t_1\,\partial_{\kappa}f_{\lambda}{}^{\theta}\,\partial^{\kappa}f_{\lambda}{}^{\theta} - \tfrac{1}{6}t_2\,\partial_{\kappa}f^{\lambda\theta}\,\partial^{\kappa}f_{\lambda}{}^{\theta} + \tfrac{1}{3}t_1\,\partial^{\alpha}f^{\lambda\theta}\,\partial^{\kappa}f_{\lambda}{}^{\theta} + \\
&\tfrac{1}{3}t_1\,\partial_{\kappa}f_{\lambda\theta}\,\omega^{\theta\beta}{}_{\theta} - \tfrac{2}{3}\,\partial^{\beta}\omega_{\nu}{}'\varrho_{\lambda}{}'\varrho_{\gamma}{}' + \tfrac{2}{3}r_2\,\partial^{\beta}\omega_{\lambda\alpha}\,\partial_{\lambda}\omega_{\alpha\beta}{}' + \\
&\tfrac{1}{9}\,\partial_{\kappa}\omega^{\theta\alpha\beta}\,\omega_{\kappa}\varrho_{\lambda}\,\varrho_{\gamma}{}' + \tfrac{2}{3}r_2\,\partial_{\kappa}\omega^{\theta\alpha\beta}\,\partial_{\lambda}\omega_{\alpha\beta}{}' + \tfrac{2}{3}r_2\,\partial^{\beta}\omega_{\lambda\alpha}\,\partial_{\lambda}\omega_{\alpha\beta}{}' + \\
&4r_3\,\partial^{\beta}\omega_{\lambda}{}^{\lambda\alpha}\,\partial_{\lambda}\omega_{\alpha\beta}{}' - 4r_3\,\partial_{\alpha}\omega_{\lambda}{}^{\alpha}{}_{\theta}\,\partial^{\lambda}\omega^{\theta\beta\kappa} + 4r_3\,\partial_{\theta}\omega_{\lambda}{}^{\alpha}{}_{\alpha}\,\partial^{\lambda}\omega^{\theta\beta\kappa}
\end{aligned}
$$

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

Table (1 sector, σ/τ)

	$\sigma_{1^+}^{\#1}{}^{\dagger\alpha\beta}$	$\sigma_{1^+}^{\#2}{}^{\dagger\alpha\beta}$	$\tau_{1^+}^{\#1}{}^{\dagger\alpha\beta}$	$\sigma_{1^-}^{\#1}{}^{\dagger\alpha}$	$\sigma_{1^-}^{\#2}{}^{\dagger\alpha}$	$\tau_{1^-}^{\#1}{}^{\dagger\alpha}$	$\tau_{1^-}^{\#2}{}^{\dagger\alpha}$
$\tau_{1^-}^{\#2}{}_\alpha$	0	0	0	$\dfrac{12ik}{(3+4k^2)^2 t_1}$	$\dfrac{12i\sqrt2\,k}{(3+4k^2)^2 t_1}$	0	$\dfrac{24k^2}{(3+4k^2)^2 t_1}$
$\tau_{1^-}^{\#1}{}_\alpha$	0	0	0	0	0	0	0
$\sigma_{1^-}^{\#2}{}_\alpha$	0	0	0	$\dfrac{6\sqrt2}{(3+4k^2)^2 t_1}$	$\dfrac{12}{(3+4k^2)^2 t_1}$	0	$-\dfrac{12i\sqrt2\,k}{(3+4k^2)^2 t_1}$
$\sigma_{1^-}^{\#1}{}_\alpha$	0	0	0	$\dfrac{6}{(3+4k^2)^2 t_1}$	$\dfrac{6\sqrt2}{(3+4k^2)^2 t_1}$	0	$-\dfrac{12ik}{(3+4k^2)^2 t_1}$
$\tau_{1^+}^{\#1}{}_{\alpha\beta}$	$\dfrac{i\sqrt2\,k(t_1-2t_2)}{3(1+k^2)t_1 t_2}$	$\dfrac{ik(t_1+4t_2)}{3(1+k^2)^2 t_1 t_2}$	$\dfrac{k^2(t_1+4t_2)}{3(1+k^2)t_1 t_2}$	0	0	0	0
$\sigma_{1^+}^{\#2}{}_{\alpha\beta}$	$\dfrac{\sqrt2(t_1-2t_2)}{3(1+k^2)t_1 t_2}$	$\dfrac{t_1+4t_2}{3(1+k^2)^2 t_1 t_2}$	$-\dfrac{ik(t_1+4t_2)}{3(1+k^2)t_1 t_2}$	0	0	0	0
$\sigma_{1^+}^{\#1}{}_{\alpha\beta}$	$\dfrac{2(t_1+t_2)}{3t_1 t_2}$	$\dfrac{\sqrt2(t_1-2t_2)}{3(1+k^2)t_1 t_2}$	$-\dfrac{i\sqrt2\,k(t_1-2t_2)}{3(1+k^2)t_1 t_2}$	0	0	0	0

Table (1 sector, f/ω)

	$\omega_{1^+}^{\#1}{}^{\dagger\alpha\beta}$	$\omega_{1^+}^{\#2}{}^{\dagger\alpha\beta}$	$f_{1^+}^{\#1}{}^{\dagger\alpha\beta}$	$\omega_{1^-}^{\#1}{}^{\dagger\alpha}$	$\omega_{1^-}^{\#2}{}^{\dagger\alpha}$	$f_{1^-}^{\#1}{}^{\dagger\alpha}$	$f_{1^-}^{\#2}{}^{\dagger\alpha}$
$f_{1^-}^{\#2}{}_\alpha$	0	0	0	$\dfrac{ikt_1}{3}$	$\dfrac{1}{3}i\sqrt2\,kt_1$	0	$\dfrac{2k^2 t_1}{3}$
$f_{1^-}^{\#1}{}_\alpha$	0	0	0	$\dfrac{t_1}{3}$	0	0	0
$\omega_{1^-}^{\#2}{}_\alpha$	0	0	0	$\dfrac{t_1}{3\sqrt2}$	$\dfrac{t_1}{3}$	0	0
$\omega_{1^-}^{\#1}{}_\alpha$	0	0	0	$\dfrac{t_1}{6}$	$\dfrac{t_1}{3\sqrt2}$	0	$-\dfrac{1}{3}i\sqrt2\,kt_1$
$f_{1^+}^{\#1}{}_{\alpha\beta}$	$\dfrac{ik(t_1-2t_2)}{3\sqrt2}$	$\dfrac{1}{3}ik(t_1+t_2)$	$\dfrac{1}{3}k^2(t_1+t_2)$	0	0	0	0
$\omega_{1^+}^{\#2}{}_{\alpha\beta}$	$-\dfrac{t_1-2t_2}{3\sqrt2}$	$\dfrac{t_1+t_2}{3}$	$-\dfrac{1}{3}ik(t_1+t_2)$	0	0	0	0
$\omega_{1^+}^{\#1}{}_{\alpha\beta}$	$\dfrac{1}{6}(t_1+4t_2)$	$-\dfrac{t_1-2t_2}{3\sqrt2}$	$\dfrac{ik(t_1-2t_2)}{3\sqrt2}$	0	0	0	0

Table ($2^{\pm}$, ω/f)

	$\omega_{2^+}^{\#1}{}^{\dagger\alpha\beta}$	$f_{2^+}^{\#1}{}^{\dagger\alpha\beta}$	$\omega_{2^-}^{\#1}{}^{\dagger\alpha\beta X}$
$\omega_{2^-}^{\#1}{}_{\alpha\beta X}$	0	0	$\dfrac{t_1}{2}$
$f_{2^+}^{\#1}{}_{\alpha\beta}$	$-\dfrac{ikt_1}{\sqrt2}$	$k^2 t_1$	0
$\omega_{2^+}^{\#1}{}_{\alpha\beta}$	$\dfrac{t_1}{2}$	$\dfrac{ikt_1}{\sqrt2}$	0

Table ($0^{\pm}$, ω/f)

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

Table ($0^{\pm}$, σ/τ)

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

Source constraints

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**

Table ($2^{\pm}$, σ/τ)

	$\sigma_{2^+}^{\#1}{}^{\dagger\alpha\beta}$	$\tau_{2^+}^{\#1}{}^{\dagger\alpha\beta}$	$\sigma_{2^-}^{\#1}{}^{\dagger\alpha\beta X}$
$\sigma_{2^-}^{\#1}{}_{\alpha\beta X}$	0	0	$\dfrac{2}{t_1}$
$\tau_{2^+}^{\#1}{}_{\alpha\beta}$	$-\dfrac{2i\sqrt2\,k}{(1+2k^2)^2 t_1}$	$\dfrac{4k^2}{(1+2k^2)^2 t_1}$	0
$\sigma_{2^+}^{\#1}{}_{\alpha\beta}$	$\dfrac{2}{(1+2k^2)^2 t_1}$	$\dfrac{2i\sqrt2\,k}{(1+2k^2)^2 t_1}$	0

Massive particle — $J^P = 0^-$, $\vec{k}^\mu$

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

Unitarity conditions
$$r_2 < 0 \;\&\&\; t_2 > 0$$

(No massless particles)