Spin-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	$-\dfrac{6ik}{(3+2k^2)^2\,t_3}$	$\dfrac{3i\sqrt{2}\,k}{(3+2k^2)^2\,t_3}$	0	$\dfrac{6k^2}{(3+2k^2)^2\,t_3}$
$\tau_{1^-}^{\#1}{}_{\alpha}$	0	0	0	0	0	0	0
$\sigma_{1^-}^{\#2}{}_{\alpha}$	0	0	0	$-\dfrac{3\sqrt{2}}{(3+2k^2)^2\,t_3}$	$\dfrac{3}{(3+2k^2)^2\,t_3}$	0	$\dfrac{3i\sqrt{2}\,k}{(3+2k^2)^2\,t_3}$
$\sigma_{1^-}^{\#1}{}_{\alpha}$	0	0	0	$\dfrac{6}{(3+2k^2)^2\,t_3}$	$-\dfrac{3\sqrt{2}}{(3+2k^2)^2\,t_3}$	0	$\dfrac{6ik}{(3+2k^2)^2\,t_3}$
$\tau_{1^+}^{\#1}{}_{\alpha\beta}$	$-\dfrac{2i\sqrt{2}}{3k r_3+3k^3 r_3}$	$\dfrac{i(9k^2+4t_2)}{3k(1+k^2)^2 r_3 t_2}$	$\dfrac{9k^2 r_3+4t_2}{3(1+k^2)^2 r_3 t_2}$	0	0	0	0
$\sigma_{1^+}^{\#2}{}_{\alpha\beta}$	$-\dfrac{2\sqrt{2}}{3k^2 r_3+3k^4 r_3}$	$\dfrac{9k^2 r_3+4t_2}{3(k+k^3)^2 r_3 t_2}$	$-\dfrac{i(9k^2+4t_2)}{3k(1+k^2)^2 r_3 t_2}$	0	0	0	0
$\sigma_{1^+}^{\#1}{}_{\alpha\beta}$	$\dfrac{2}{3k^2 r_3}$	$-\dfrac{2\sqrt{2}}{3k^2 r_3+3k^4 r_3}$	$\dfrac{2i\sqrt{2}}{3k r_3+3k^3 r_3}$	0	0	0	0

Spin-1 sector (ω, f)

	$\omega_{1^+}^{\#1}\dagger^{\alpha\beta}$	$\omega_{1^+}^{\#2}\dagger^{\alpha\beta}$	$f_{1^+}^{\#1}\dagger^{\alpha\beta}$	$\omega_{1^-}^{\#1}\dagger^{\alpha}$	$\omega_{1^-}^{\#2}\dagger^{\alpha}$	$f_{1^-}^{\#1}\dagger^{\alpha}$	$f_{1^-}^{\#2}\dagger^{\alpha}$
$f_{1^-}^{\#2}{}_{\alpha}$	0	0	0	0	$-\dfrac{2}{3}i k t_3$	$\dfrac{1}{3}i\sqrt{2}\,t_3$	$\dfrac{2k^2 t_3}{3}$
$f_{1^-}^{\#1}{}_{\alpha}$	0	0	0	0	0	0	0
$\omega_{1^-}^{\#2}{}_{\alpha}$	0	0	0	$-\dfrac{\sqrt{2}\,t_3}{3}$	$\dfrac{t_3}{3}$	0	$-\dfrac{1}{3}i\sqrt{2}\,k t_3$
$\omega_{1^-}^{\#1}{}_{\alpha}$	0	0	0	$\dfrac{2t_3}{3}$	$-\dfrac{\sqrt{2}\,t_3}{3}$	0	$\dfrac{2ik t_3}{3}$
$f_{1^+}^{\#1}{}_{\alpha\beta}$	$\dfrac{1}{3}i\sqrt{2}\,k t_2$	$\dfrac{ik t_2}{3}$	$\dfrac{k^2 t_2}{3}$	0	0	0	0
$\omega_{1^+}^{\#2}{}_{\alpha\beta}$	$\dfrac{\sqrt{2}\,t_2}{3}$	$\dfrac{t_2}{3}$	$-\dfrac{1}{3}ik t_2$	0	0	0	0
$\omega_{1^+}^{\#1}{}_{\alpha\beta}$	$\dfrac{1}{6}\left(9k^2 r_3+4t_2\right)$	$\dfrac{\sqrt{2}\,t_2}{3}$	$-\dfrac{1}{3}i\sqrt{2}\,k t_2$	0	0	0	0

Spin-2 sector (σ, τ)

	$\sigma_{2^+}^{\#1}\dagger^{\alpha\beta}$	$\tau_{2^+}^{\#1}\dagger^{\alpha\beta}$	$\sigma_{2^-}^{\#1}\dagger^{\alpha\beta\chi}$
$\sigma_{2^+}^{\#1}{}_{\alpha\beta}$	$-\dfrac{2}{3k^2 r_3}$	0	0
$\tau_{2^+}^{\#1}{}_{\alpha\beta}$	0	0	0
$\sigma_{2^-}^{\#1}{}_{\alpha\beta\chi}$	0	0	0

Spin-2 sector (ω, f)

	$\omega_{2^+}^{\#1}\dagger^{\alpha\beta}$	$f_{2^+}^{\#1}\dagger^{\alpha\beta}$	$\omega_{2^-}^{\#1}\dagger^{\alpha\beta\chi}$
$\omega_{2^+}^{\#1}{}_{\alpha\beta}$	$-\dfrac{3k^2 r_3}{2}$	0	0
$f_{2^+}^{\#1}{}_{\alpha\beta}$	0	0	0
$\omega_{2^-}^{\#1}{}_{\alpha\beta\chi}$	0	0	0

Spin-0 sector (σ, τ)

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

Spin-0 sector (ω, f)

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

Source constraints

SO(3) irreps	#
$\tau_{0^+}^{\#2}==0$	1
$\tau_{0^+}^{\#1}-2ik\,\sigma_{0^+}^{\#1}==0$	1
$\tau_{0^+}^{\#2\,\alpha}-ik\,\sigma_{1^-}^{\#1\,\alpha}==0$	3
$\tau_{1^-}^{\#1\,\alpha}==0$	3
$\sigma_{1^+}^{\#1\,\alpha}+2\,\sigma_{1^-}^{\#2\,\alpha}==0$	3
$\tau_{1^+}^{\#1\,\alpha\beta}+ik\,\sigma_{1^+}^{\#2\,\alpha\beta}==0$	3
$\sigma_{2^-}^{\#1\,\alpha\beta\chi}==0$	5
$\tau_{2^+}^{\#1\,\alpha\beta}==0$	5
Total #:	24

Lagrangian density

$$\tfrac{2}{3}t_3\,\omega_i{}^{\alpha i}\omega_{\kappa\alpha}{}^{\kappa}+\tfrac{2}{3}t_2\,\omega_i{}^{\kappa\lambda}\omega_{\kappa\lambda}{}^{i}+\tfrac{1}{3}t_2\,\omega_{\kappa\lambda}{}^{i}\omega_i{}^{\kappa\lambda}+f^{\alpha\beta}\tau_{\alpha\beta}+\omega^{\alpha\beta\chi}\sigma_{\alpha\beta\chi}+$$
$$\tfrac{2}{3}r_2\,\partial^\beta\omega_\kappa{}^{\theta\alpha}\partial_\theta\omega_{\alpha\beta}{}^{\kappa}-\tfrac{1}{3}r_2\,\partial_\theta\omega_{\alpha\beta}{}^{\kappa}\partial_\kappa\omega^{\theta\alpha\beta}-r_3\,\partial_\alpha\omega_\lambda{}^{\theta}{}_\theta\partial_\kappa\omega^{\theta\kappa\lambda}-r_3\,\partial_\theta\omega_\lambda{}^\alpha{}_\alpha\partial_\kappa\omega^{\theta\kappa\lambda}+\tfrac{1}{6}\partial^\alpha f_{\theta\kappa}\partial^\kappa f_\alpha{}^\theta-$$
$$\tfrac{1}{6}t_2\,\partial^\alpha f_{\kappa\theta}\partial^\kappa f_\alpha{}^\theta+\tfrac{1}{6}t_2\,\partial^\alpha f_\kappa{}^\lambda\partial^\kappa f_{\alpha\lambda}-\tfrac{2}{3}t_3\,\omega_\kappa{}^\alpha{}_\alpha\partial^\kappa f^l{}_l-\tfrac{2}{3}t_3\,\omega_{\kappa\lambda}{}^\lambda\partial^\kappa f^{l\theta}{}_\theta-$$
$$\tfrac{4}{3}t_3\,\partial^\alpha f_{\kappa\alpha}\partial^\kappa f_l{}^l+\tfrac{1}{3}t_2\,\partial_\kappa f^\lambda{}_\lambda\partial^\kappa f^l{}_l+\tfrac{1}{3}t_2\,\omega_{l\theta\kappa}\partial^\kappa f^{l\theta}-\tfrac{2}{3}t_2\,\omega_{l\kappa\theta}\partial^\kappa f^{l\theta}-$$
$$\tfrac{1}{3}t_2\,\omega_{\theta l\kappa}\partial^\kappa f^{l\theta}+\tfrac{2}{3}t_3\,\omega_{l\alpha}{}^\alpha\partial^\kappa f^l{}_\kappa+\tfrac{2}{3}t_3\,\omega_{l\lambda}{}^\lambda\partial^\kappa f^l{}_\kappa-$$
$$\tfrac{1}{6}t_2\,\partial^\alpha f_\kappa{}^\lambda\partial^\kappa f_{\lambda\alpha}-\tfrac{1}{6}t_2\,\partial_\kappa f_\theta{}^\lambda\partial^\kappa f_\lambda{}^\theta+\tfrac{1}{6}\partial_\kappa f^\lambda{}_\theta\partial^\kappa f_\lambda{}^\theta+\tfrac{1}{3}\partial^\alpha f^\lambda{}_\theta\partial^\kappa f_{\lambda\kappa}+$$
$$\tfrac{1}{6}r_2\,\partial_\kappa\omega^{\alpha\beta\theta}\partial^\kappa\omega_{\alpha\beta\theta}+\tfrac{2}{3}r_2\,\partial_\kappa\omega^{\theta\alpha\beta}\partial_\lambda\omega_{\alpha\beta}{}^\lambda-\tfrac{2}{3}r_2\,\partial^\beta\omega^{\alpha\lambda}{}_\theta\partial_\lambda\omega_{\alpha\beta}{}^\theta+$$
$$\tfrac{2}{3}r_2\,\partial^\beta\omega_l{}^{\lambda\alpha}\partial_\lambda\omega_{\alpha\beta}{}^l-4r_3\,\partial^\beta\omega_l{}^{\lambda\alpha}\partial_\lambda\omega_{\alpha\beta}{}^l-r_3\,\partial_\alpha\omega_\lambda{}_\theta\partial^\lambda\omega^{\theta\kappa}{}_\kappa+r_3\,\partial_\theta\omega_\lambda{}^\alpha{}_\alpha\partial^\lambda\omega^{\theta\kappa}{}_\kappa$$

Massive particle

$J^P = 0^-$

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)