Tables

$J^P = 1$ 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	$\dfrac{2i}{kr_5+2k^3r_5}$	$\dfrac{i\sqrt2\,(3k^2r_5+2t_3)}{k(1+2k^2)^2r_5t_3}$	0	$\dfrac{6k^2r_5+4t_3}{(1+2k^2)^2r_5t_3}$
$\tau_{1-}^{\#1}{}_\alpha$	0	0	0	0	0	0	0
$\sigma_{1-}^{\#2}{}_\alpha$	0	0	0	$\dfrac{\sqrt2}{k^2r_5+2k^4r_5}$	$\dfrac{3k^2r_5+2t_3}{(k+2k^3)^2r_5t_3}$	0	$-\dfrac{i\sqrt2\,(3k^2r_5+2t_3)}{k(1+2k^2)^2r_5t_3}$
$\sigma_{1-}^{\#1}{}_\alpha$	0	0	0	$\dfrac{1}{k^2r_5}$	$\dfrac{\sqrt2}{k^2r_5+2k^4r_5}$	0	$-\dfrac{2i}{kr_5+2k^3r_5}$
$\tau_{1+}^{\#1}{}_{\alpha\beta}$	$-\dfrac{i\sqrt2}{kr_5+k^3r_5}$	$\dfrac{i(3k^2r_5+2t_2)}{k(1+k^2)^2r_5t_2}$	$\dfrac{3k^2r_5+2t_2}{(1+k^2)^2r_5t_2}$	0	0	0	0
$\sigma_{1+}^{\#2}{}_{\alpha\beta}$	$-\dfrac{\sqrt2}{k^2r_5+k^4r_5}$	$\dfrac{3k^2r_5+2t_2}{(k+k^3)^2r_5t_2}$	$-\dfrac{i(3k^2r_5+2t_2)}{k(1+k^2)^2r_5t_2}$	0	0	0	0
$\sigma_{1+}^{\#1}{}_{\alpha\beta}$	$\dfrac{1}{k^2r_5}$	$-\dfrac{\sqrt2}{k^2r_5+k^4r_5}$	$\dfrac{i\sqrt2}{kr_5+k^3r_5}$	0	0	0	0

$J^P = 1$ 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	$-\dfrac{2}{3}ikt_3$	$\dfrac{1}{3}i\sqrt2\,kt_3$	0	$\dfrac{2k^2t_3}{3}$
$f_{1-}^{\#1}{}_\alpha$	0	0	0	0	0	0	0
$\omega_{1-}^{\#2}{}_\alpha$	0	0	0	$-\dfrac{\sqrt2\,t_3}{3}$	$\dfrac{t_3}{3}$	0	$-\dfrac{1}{3}i\sqrt2\,kt_3$
$\omega_{1-}^{\#1}{}_\alpha$	0	0	0	$k^2r_5+\dfrac{2t_3}{3}$	$-\dfrac{\sqrt2\,t_3}{3}$	0	$\dfrac{2ikt_3}{3}$
$f_{1+}^{\#1}{}_{\alpha\beta}$	$\dfrac{1}{3}i\sqrt2\,kt_2$	$\dfrac{ikt_2}{3}$	$\dfrac{k^2t_2}{3}$	0	0	0	0
$\omega_{1+}^{\#2}{}_{\alpha\beta}$	$\dfrac{\sqrt2\,t_2}{3}$	$\dfrac{t_2}{3}$	$-\dfrac{1}{3}ikt_2$	0	0	0	0
$\omega_{1+}^{\#1}{}_{\alpha\beta}$	$k^2r_5+\dfrac{2t_2}{3}$	$\dfrac{\sqrt2\,t_2}{3}$	$-\dfrac{1}{3}i\sqrt2\,kt_2$	0	0	0	0

$J^P = 2$ sectors

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

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

$J^P = 0$ sector (σ/τ)

	$\sigma_{0+}^{\#1}$	$\tau_{0+}^{\#1}$	$\tau_{0+}^{\#2}$	$\sigma_{0-}^{\#1}$
$\sigma_{0+}^{\#1}\dagger$	$\dfrac{1}{(1+2k^2)^2t_3}$	$-\dfrac{i\sqrt2\,k}{(1+2k^2)^2t_3}$	0	0
$\tau_{0+}^{\#1}\dagger$	$\dfrac{i\sqrt2\,k}{(1+2k^2)^2t_3}$	$\dfrac{2k^2}{(1+2k^2)^2t_3}$	0	0
$\tau_{0+}^{\#2}\dagger$	0	0	0	0
$\sigma_{0-}^{\#1}\dagger$	0	0	0	$\dfrac{1}{k^2r_2+t_2}$

$J^P = 0$ sector (ω/f)

	$\omega_{0+}^{\#1}$	$f_{0+}^{\#1}$	$f_{0+}^{\#2}$	$\omega_{0-}^{\#1}$
$\omega_{0+}^{\#1}\dagger$	t_3	$i\sqrt2\,kt_3$	0	0
$f_{0+}^{\#1}\dagger$	$-i\sqrt2\,kt_3$	$2k^2t_3$	0	0
$f_{0+}^{\#2}\dagger$	0	0	0	0
$\omega_{0-}^{\#1}\dagger$	0	0	0	$k^2r_2+t_2$

Source constraints

SO(3) irreps	#
$\tau_{0+}^{\#2}==0$	1
$\tau_{0+}^{\#1}-2ik\,\sigma_{0+}^{\#1}==0$	1
$\tau_{1-}^{\#2\,\alpha}+2ik\,\sigma_{1-}^{\#2\,\alpha}==0$	3
$\tau_{1-}^{\#1\,\alpha}==0$	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
$\sigma_{2+}^{\#1\,\alpha\beta}==0$	5
Total #:	26

Lagrangian density

$$
\begin{aligned}
&\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}-r_5\,\partial_i\omega_\kappa{}^{\kappa\lambda}\partial^i\omega_{\lambda}{}^\alpha{}_\alpha+\\
&\tfrac{2}{3}r_2\,\partial_\beta\omega_\kappa{}^{\theta\alpha}\partial_\theta\omega_{\kappa}{}^{\alpha\beta\theta}-\tfrac{1}{3}r_2\,\partial_\theta\omega_{\kappa}{}^{\alpha\beta\theta}\partial_\kappa\omega_{\alpha\beta}-\tfrac{2}{3}r_2\,\partial_\theta\omega_\kappa{}^\kappa\partial_\kappa\omega^{\theta\alpha\beta}-\\
&r_5\,\partial_\alpha\omega_\lambda{}^\alpha\partial_\kappa\omega^{\theta\kappa\lambda}+r_5\,\partial_\theta\omega_\lambda{}^\alpha\partial_\kappa\omega^{\theta\kappa\lambda}-r_5\,\partial_\alpha\omega_\lambda{}^\alpha\partial_\kappa\omega^{\kappa\lambda\theta}+\\
&2r_5\,\partial_\theta\omega_\lambda{}^\alpha\partial_\kappa\omega^{\kappa\lambda\theta}+\tfrac{1}{6}t_2\,\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\partial^\kappa f^i{}_i-\tfrac{2}{3}t_3\,\omega_\kappa{}^\lambda\partial^\alpha f_{\kappa\lambda}\partial^\kappa f^i{}_i-\tfrac{4}{3}t_3\,\partial^\alpha f_{\kappa\alpha}\partial^\kappa f^i{}_i+\\
&\tfrac{2}{3}t_3\,\partial_\kappa f^\lambda{}_\lambda\partial^\kappa f^i{}_i+\tfrac{1}{3}t_2\,\omega_{i\theta\kappa}\partial^\kappa f^{i\theta}-\tfrac{2}{3}t_2\,\omega_{i\kappa\theta}\partial^\kappa f^{i\theta}-\tfrac{1}{3}t_2\,\omega_{\theta i\kappa}\partial^\kappa f^{i\theta}+\\
&\tfrac{2}{3}t_2\,\omega_{\theta\kappa i}\partial^\kappa f^{i\theta}+\tfrac{2}{3}t_3\,\omega_{i\alpha}{}^\alpha\partial^\kappa f^i{}_\kappa+\tfrac{2}{3}t_3\,\omega_{i\lambda}{}^\lambda\partial^\kappa f^i{}_\kappa-\tfrac{1}{6}t_2\,\partial^\alpha f^\lambda{}_\kappa\partial^\kappa f_{\lambda\alpha}-\\
&\tfrac{1}{6}t_2\,\partial_\kappa f_\theta{}^\lambda\partial^\kappa f_\lambda{}^\theta+\tfrac{1}{6}t_2\,\partial_\kappa f^\lambda{}_\theta\partial^\kappa f_\lambda{}^\theta+\tfrac{1}{3}t_3\,\partial^\alpha f_{\lambda\kappa}\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\theta}-\tfrac{2}{3}r_2\,\partial^\beta\omega_i{}^{\alpha\lambda}\partial_\lambda\omega_{\alpha\beta}{}^i+\\
&\tfrac{2}{3}r_2\,\partial^\beta\omega_i{}^{\lambda\alpha}\partial_\lambda\omega^i{}_\alpha{}_\theta\partial^\lambda\omega^{\theta\kappa}-r_5\,\partial_\alpha\omega_\lambda{}^\alpha\partial^\lambda\omega^{\theta\kappa}{}_\kappa\\[4pt]
&\text{Added source term:}\quad f^{\alpha\beta}\dagger\,\tau_{\alpha\beta}+\omega^{\alpha\beta\chi}\,\sigma_{\alpha\beta\chi}
\end{aligned}
$$

Massive particle

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

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)