Massive particle

Pole residue:	$-\dfrac{1}{r_1} > 0$
Polarisations:	5
Square mass:	$-\dfrac{t_1}{2 r_1} > 0$
Spin:	2
Parity:	Odd

$J^P = 2^-$, $\vec{k^\mu}$

Unitarity conditions

$r_1 < 0 \ \&\& \ t_1 > 0$

(No massless particles)

Large 1 matrix

	$\sigma_{1^+}^{\#1}\dagger^{\alpha\beta}$	$\sigma_{1^+}^{\#2}\dagger^{\alpha}$	$\tau_{1^+}^{\#1}\dagger^{\alpha}$	$\sigma_{1^-}^{\#1}\dagger^{\alpha}$	$\sigma_{1^-}^{\#2}\dagger^{\alpha}$	$\tau_{1^-}^{\#1}\dagger^{\alpha}$	$\tau_{1^-}^{\#2}\dagger^{\alpha}$
$\tau_{1^-}^{\#2}{}_{\alpha}$	0	0	0	$\dfrac{2 i k}{t_1+2 k^2 t_1}$	$\dfrac{i \sqrt{2}\, k\,(2 k^2 r_1+t_1)}{(t_1+2 k^2 t_1)^2}$	0	$\dfrac{2 k^2 (2 k^2 r_1+t_1)}{(t_1+2 k^2 t_1)^2}$
$\tau_{1^-}^{\#1}{}_{\alpha}$	0	0	0	0	0	0	0
$\sigma_{1^-}^{\#2}{}_{\alpha}$	0	0	0	$\dfrac{\sqrt{2}}{t_1+2 k^2 t_1}$	$\dfrac{2 k^2 r_1+t_1}{(t_1+2 k^2 t_1)^2}$	0	$-\dfrac{i \sqrt{2}\, k\,(2 k^2 r_1+t_1)}{(t_1+2 k^2 t_1)^2}$
$\sigma_{1^-}^{\#1}{}_{\alpha}$	0	0	0	0	$\dfrac{\sqrt{2}}{t_1+2 k^2 t_1}$	0	$-\dfrac{2 i k}{t_1+2 k^2 t_1}$
$\tau_{1^+}^{\#1}{}_{\alpha}$	$-\dfrac{i \sqrt{2}\, k}{t_1+k^2 t_1}$	$\dfrac{i k}{(1+k^2)^2 t_1}$	$\dfrac{k^2}{(1+k^2)^2 t_1}$	0	0	0	0
$\sigma_{1^+}^{\#2}{}_{\alpha\beta}$	$-\dfrac{\sqrt{2}}{t_1+k^2 t_1}$	$\dfrac{1}{(1+k^2)^2 t_1}$	$\dfrac{i k}{(1+k^2)^2 t_1}$	0	0	0	0
$\sigma_{1^+}^{\#1}{}_{\alpha\beta}$	0	$-\dfrac{\sqrt{2}}{t_1+k^2 t_1}$	$\dfrac{i \sqrt{2}\, k}{t_1+k^2 t_1}$	0	0	0	0

2^+ / 2^- matrix

	$\sigma_{2^+}^{\#1}{}_{\alpha\beta}$	$\tau_{2^+}^{\#1}{}_{\alpha\beta}$	$\sigma_{2^-}^{\#1}{}_{\alpha\beta\chi}$
$\sigma_{2^+}^{\#1}\dagger^{\alpha\beta}$	$\dfrac{2}{(1+2 k^2)^2 t_1}$	$-\dfrac{2 i \sqrt{2}\, k}{(1+2 k^2)^2 t_1}$	0
$\tau_{2^+}^{\#1}\dagger^{\alpha\beta}$	$\dfrac{2 i \sqrt{2}\, k}{(1+2 k^2)^2 t_1}$	$\dfrac{4 k^2}{(1+2 k^2)^2 t_1}$	0
$\sigma_{2^-}^{\#1}\dagger^{\alpha\beta\chi}$	0	0	$\dfrac{2}{2 k^2 r_1+t_1}$

0^+ / 0^- matrix

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

Large 1 (ω,f) matrix

	$\omega_{1^+}^{\#1}\dagger^{\alpha\beta}$	$\omega_{1^+}^{\#2}\dagger^{\alpha}$	$f_{1^+}^{\#1}\dagger^{\alpha}$	$\omega_{1^-}^{\#1}\dagger^{\alpha}$	$\omega_{1^-}^{\#2}\dagger^{\alpha}$	$f_{1^-}^{\#1}\dagger^{\alpha}$	$f_{1^-}^{\#2}\dagger^{\alpha}$
$f_{1^-}^{\#2}{}_{\alpha}$	0	0	0	$i k t_1$	0	0	0
$f_{1^-}^{\#1}{}_{\alpha}$	0	0	0	0	0	0	0
$\omega_{1^-}^{\#2}{}_{\alpha}$	0	0	0	$\dfrac{t_1}{\sqrt{2}}$	0	0	0
$\omega_{1^-}^{\#1}{}_{\alpha}$	0	0	0	$-k^2 r_1-\dfrac{t_1}{2}$	$\dfrac{t_1}{\sqrt{2}}$	0	$-i k t_1$
$f_{1^+}^{\#1}{}_{\alpha\beta}$	$-\dfrac{i k t_1}{\sqrt{2}}$	0	0	0	0	0	0
$\omega_{1^+}^{\#2}{}_{\alpha\beta}$	$-\dfrac{t_1}{\sqrt{2}}$	0	0	0	0	0	0
$\omega_{1^+}^{\#1}{}_{\alpha\beta}$	$-\dfrac{t_1}{2}$	$-\dfrac{t_1}{\sqrt{2}}$	$\dfrac{i k t_1}{\sqrt{2}}$	0	0	0	0

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2 (ω,f) matrix

	$\omega_{2^+}^{\#1}{}_{\alpha\beta}$	$f_{2^+}^{\#1}{}_{\alpha\beta}$	$\omega_{2^-}^{\#1}{}_{\alpha\beta\chi}$
$\omega_{2^+}^{\#1}\dagger^{\alpha\beta}$	$\dfrac{t_1}{2}$	$-\dfrac{i k t_1}{\sqrt{2}}$	0
$f_{2^+}^{\#1}\dagger^{\alpha\beta}$	$\dfrac{i k t_1}{\sqrt{2}}$	$k^2 t_1$	0
$\omega_{2^-}^{\#1}\dagger^{\alpha\beta\chi}$	0	0	$k^2 r_1+\dfrac{t_1}{2}$

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0 (σ,τ) matrix

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

Source constraints

SO(3) irreps	#
$\tau_{0^+}^{\#2} == 0$	1
$\tau_{0^+}^{\#1} - 2 i k\, \sigma_{0^+}^{\#1} == 0$	1
$\tau_{1^-}^{\#2\,\alpha} + 2 i k\, \sigma_{1^-}^{\#2\,\alpha} == 0$	3
$\tau_{1^-}^{\#1\,\alpha} == 0$	3
$\tau_{1^+}^{\#1\,\alpha\beta} + i k\, \sigma_{1^+}^{\#2\,\alpha\beta} == 0$	3
$\tau_{2^+}^{\#1\,\alpha\beta} - 2 i k\, \sigma_{2^+}^{\#2\,\alpha\beta} == 0$	5
Total #:	16

Lagrangian density

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-t_1\,\omega_i{}^{\kappa\lambda}\omega^i{}_{\kappa\lambda} + 2 r_1\,\omega'_i\,\partial_{\gamma\kappa}\omega^{\kappa\lambda}{}_\lambda - t_1\,\omega_{i\kappa\alpha}\,\omega'^\alpha{}_\kappa\,\omega_{\rho\lambda}{}^\kappa\,\omega'^\lambda{}_\alpha - \tfrac{2}{3} r_1\,\omega_{\alpha\beta}{}^\theta\,\partial_\theta\,\omega_\kappa{}^{\alpha\beta} + \tfrac{2}{3} r_1\,\omega_{\theta\beta}{}^\kappa\,\partial_\kappa\,\omega^{\theta\alpha}{}_\beta + 2 r_1\,\partial_\alpha\omega_\lambda{}^\alpha{}_\theta\,\partial_\kappa\,\omega^{\theta\kappa\lambda} - 2 r_1\,\partial_\theta\omega_\lambda{}^\alpha{}_\alpha\,\partial_\kappa\,\omega^{\kappa\lambda\theta} - 4 r_1\,\partial_\theta\omega_\lambda{}^\alpha{}_\alpha\,\partial_\kappa\,\omega^{\kappa\lambda\theta} - \tfrac{1}{2} t_1\,\partial^\alpha f\,\partial^\kappa f_\theta{}^\theta{}_\alpha - \tfrac{1}{2} t_1\,\partial^\alpha f\,\partial^\kappa f_\alpha - \tfrac{1}{2} t_1\,\partial^\alpha f^\lambda{}_\kappa\,\partial^\kappa f_{\lambda\alpha} + t_1\,\omega_{\kappa\alpha}{}^\lambda\,\partial^\kappa f'_i + t_1\,\omega_{i\kappa}{}^\lambda\,\partial^\kappa f'_i + 2 t_1\,\partial^\alpha f_\kappa\,\partial^\kappa f'_i - t_1\,\partial_\kappa f^\lambda{}_\lambda\,\partial^\kappa f'_i + 2 t_1\,\omega_{i\kappa\theta}\,\partial^{\kappa}f'^\theta - t_1\,\omega_{i\alpha}{}^\alpha\,\partial^\kappa f'_\kappa - t_1\,\omega_{i\lambda}{}^\lambda\,\partial^\kappa f'_\kappa + \tfrac{1}{2} t_1\,\partial^\alpha f_\kappa\,\partial^\kappa f_{\lambda\alpha} + \tfrac{1}{2} t_1\,\partial_\kappa f^\lambda{}_\theta\,\partial^\kappa f_\lambda{}^\theta + \tfrac{1}{2} t_1\,\partial_\kappa f^\lambda{}_\alpha\,\partial^\kappa f_{\lambda\kappa} - \tfrac{2}{3} r_1\,\partial_\kappa\omega^{\alpha\beta\theta}\,\partial^\kappa\omega_{\alpha\beta\theta} - \tfrac{2}{3} r_1\,\partial_\kappa\omega^{\theta\alpha\beta}\,\partial^\kappa\omega_{\alpha\beta\theta} + \tfrac{2}{3} r_1\,\partial_\theta\omega_i{}^{\alpha\lambda}\,\partial_\lambda\omega_{\alpha\beta}{}^i - \tfrac{8}{3} r_1\,\partial^\beta{}_\lambda{}^\alpha\partial_\lambda\omega_{\alpha\beta}{}^i - 2 r_1\,\partial_\alpha\omega_\lambda{}^\alpha\,\partial^\lambda\omega^{\theta\kappa} + 2 r_1\,\partial_\theta\omega_\lambda{}^\alpha{}_\alpha\,\partial^\lambda\omega^{\theta\kappa}{}_\kappa
$$

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