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
$\sigma_{2^-}^{\#1\,\alpha\beta\chi} == 0$	5
$\tau_{2^+}^{\#1\,\alpha\beta} == 0$	5
Total #:	21

(Spin-0 saturated propagator block)

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

(Spin-2 σ/τ block)

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

(Spin-2 ω/f block)

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

(Spin-0 ω/f block)

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

(Spin-1 σ/τ block)

	$\sigma_{1^+}^{\#1}\dagger^{\alpha\beta}$	$\sigma_{1^+}^{\#2}\dagger^{\alpha\beta}$	$\tau_{1^+}^{\#1}\dagger^{\alpha\beta}$	$\sigma_{1^-}^{\#1}\dagger^{\alpha}$	$\sigma_{1^-}^{\#2}\dagger^{\alpha}$	$\tau_{1^-}^{\#1}\dagger^{\alpha}$	$\tau_{1^-}^{\#2}\dagger^{\alpha}$
$\tau_{1^-}^{\#2}{}_{\alpha}$	0	0	0	$\dfrac{4i}{k(1+2k^2)(r_3+2r_5)}$	$\dfrac{i\sqrt{2}\,(3k^2(3r_3+2r_5)+4t_3)}{k(1+2k^2)^2(r_3+2r_5)t_3}$		$\dfrac{6k^2(r_3+2r_5)+8t_3}{(1+2k^2)^2(r_3+2r_5)t_3}$
$\tau_{1^-}^{\#1}{}_{\alpha}$	0	0	0	0	0	0	0
$\sigma_{1^-}^{\#2}{}_{\alpha}$	0	0	0	$\dfrac{2\sqrt{2}}{k^2(1+2k^2)(r_3+2r_5)}$	$\dfrac{3k^2(r_3+2r_5)+4t_3}{(k+2k^3)^2(r_3+2r_5)t_3}$	0	$-\dfrac{i\sqrt{2}\,(3k^2(3r_3+2r_5)+4t_3)}{k(1+2k^2)^2(r_3+2r_5)t_3}$
$\sigma_{1^-}^{\#1}{}_{\alpha}$	0	0	0	$\dfrac{2}{k^2(r_3+2r_5)}$	$\dfrac{2\sqrt{2}}{k^2(1+2k^2)(r_3+2r_5)}$	0	$-\dfrac{4i}{k(1+2k^2)(r_3+2r_5)}$
$\tau_{1^+}^{\#1}{}_{\alpha\beta}$	$-\dfrac{i\sqrt{2}}{k(1+k^2)(2r_3+r_5)}$	$\dfrac{i(3k^2(2r_3+r_5)+2t_2)}{k(1+k^2)^2(2r_3+r_5)t_2}$	$\dfrac{3k^2(2r_3+r_5)+2t_2}{(1+k^2)^2(2r_3+r_5)t_2}$	0	0	0	0
$\sigma_{1^+}^{\#2}{}_{\alpha\beta}$	$\dfrac{\sqrt{2}}{k^2(1+k^2)(2r_3+r_5)}$	$\dfrac{3k^2(2r_3+r_5)+2t_2}{(k+k^3)^2(2r_3+r_5)t_2}$	$-\dfrac{i(3k^2(2r_3+r_5)+2t_2)}{k(1+k^2)^2(2r_3+r_5)t_2}$	0	0	0	0
$\sigma_{1^+}^{\#1}{}_{\alpha\beta}$	$\dfrac{1}{k^2(2r_3+r_5)}$	$-\dfrac{\sqrt{2}}{k^2(1+k^2)(2r_3+r_5)}$	$\dfrac{i\sqrt{2}}{k(1+k^2)(2r_3+r_5)}$	0	0	0	0

(Spin-1 ω/f block)

	$\omega_{1^+}^{\#1}\dagger^{\alpha\beta}$	$\omega_{1^+}^{\#2}\dagger^{\alpha\beta}$	$f_{1^+}^{\#1}\dagger^{\alpha\beta}$	$\omega_{1^-}^{\#1}\dagger^{\alpha}$	$\omega_{1^-}^{\#2}\dagger^{\alpha}$	$f_{1^-}^{\#1}\dagger^{\alpha}$	$f_{1^-}^{\#2}\dagger^{\alpha}$
$f_{1^-}^{\#2}{}_{\alpha}$	0	0	0	$-\tfrac{2}{3}i k t_3$	$\tfrac{1}{3}i\sqrt{2}\,k t_3$	0	$\dfrac{2k^2 t_3}{3}$
$f_{1^-}^{\#1}{}_{\alpha}$	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	$-\tfrac{1}{3}i\sqrt{2}\,k t_3$
$\omega_{1^-}^{\#1}{}_{\alpha}$	0	0	0	$k^2\left(\tfrac{3}{2}+r_5\right)+\dfrac{2t_3}{3}$	$-\dfrac{\sqrt{2}\,t_3}{3}$	0	$\dfrac{2i k t_3}{3}$
$f_{1^+}^{\#1}{}_{\alpha\beta}$	$\tfrac{1}{3}i\sqrt{2}\,k t_2$	$\dfrac{i k t_2}{3}$	$\dfrac{k^2 t_2}{3}$	0	0	0	0
$\omega_{1^+}^{\#2}{}_{\alpha\beta}$	$\dfrac{\sqrt{2}\,t_2}{3}$	$\dfrac{t_2}{3}$	$-\tfrac{1}{3}i k t_2$	0	0	0	0
$\omega_{1^+}^{\#1}{}_{\alpha\beta}$	$k^2(2r_3+r_5)+\dfrac{2t_2}{3}$	$\dfrac{\sqrt{2}\,t_2}{3}$	$-\tfrac{1}{3}i\sqrt{2}\,k t_2$	0	0	0	0

Lagrangian density

$$\frac{2}{3}t_3\,\omega_\iota{}^{\alpha\iota}\,\omega_{\kappa\alpha}{}^\kappa + \frac{2}{3}t_2\,\omega_\iota{}^{\kappa\lambda}\,\omega_{\kappa\lambda}{}^\iota + \frac{1}{3}t_2\,\omega_{\kappa\lambda}{}^\iota\,\omega^{\kappa\lambda}{}_\iota + f^{\alpha\beta}\,\tau_{\alpha\beta} +$$

$$\omega^{\alpha\beta\chi}\,\sigma_{\alpha\beta\chi} - \frac{1}{2}r_3\,\partial_\iota\omega^{\kappa\lambda}{}_\kappa\,\partial^\iota\omega_\lambda{}^\alpha{}_\alpha - r_5\,\partial_\iota\omega^{\kappa\lambda}{}_\kappa\,\partial^\iota\omega_\lambda{}^\alpha{}_\alpha + \frac{1}{2}r_3\,\partial_\alpha\omega_\lambda{}^\alpha{}_\theta\,\partial_\kappa\omega^{\theta\kappa\lambda} -$$

$$r_5\,\partial_\alpha\omega_\lambda{}^\alpha{}_\theta\,\partial_\kappa\omega^{\theta\kappa\lambda} - \frac{1}{2}r_3\,\partial_\theta\omega_\lambda{}^\alpha{}_\alpha\,\partial_\kappa\omega^{\theta\kappa\lambda} + r_5\,\partial_\theta\omega_\lambda{}^\alpha{}_\alpha\,\partial_\kappa\omega^{\theta\kappa\lambda} - \frac{1}{2}r_3\,\partial_\alpha\omega_\lambda{}^\alpha{}_\theta\,\partial_\kappa\omega^{\kappa\lambda\theta} -$$

$$r_5\,\partial_\alpha\omega_\lambda{}^\alpha{}_\theta\,\partial_\kappa\omega^{\kappa\lambda\theta} + r_3\,\partial_\theta\omega_\lambda{}^\alpha{}_\alpha\,\partial_\kappa\omega^{\kappa\lambda\theta} + 2r_5\,\partial_\theta\omega_\lambda{}^\alpha{}_\alpha\,\partial_\kappa\omega^{\kappa\lambda\theta} +$$

$$\frac{1}{6}t_2\,\partial^\alpha f_{\theta\kappa}\,\partial^\kappa f_\alpha{}^\theta - \frac{1}{6}t_2\,\partial^\alpha f_{\kappa\theta}\,\partial^\kappa f_\alpha{}^\theta + \frac{1}{6}t_2\,\partial^\alpha f^\lambda{}_\kappa\,\partial^\kappa f_{\alpha\lambda} - \frac{2}{3}t_3\,\omega_{\kappa\alpha}{}^\alpha\,\partial^\kappa f^\iota{}_\iota -$$

$$\frac{2}{3}t_3\,\omega_{\kappa\lambda}{}^\lambda\,\partial^\kappa f^\iota{}_\iota - \frac{4}{3}t_3\,\partial^\alpha f_{\kappa\alpha}\,\partial^\kappa f^\iota{}_\iota + \frac{2}{3}t_3\,\partial_\kappa f^\lambda{}_\lambda\,\partial^\kappa f^\iota{}_\iota + \frac{1}{3}t_2\,\omega_{\iota\theta\kappa}\,\partial^\kappa f^{\iota\theta} -$$

$$\frac{2}{3}t_2\,\omega_{\iota\kappa\theta}\,\partial^\kappa f^{\iota\theta} - \frac{1}{3}t_2\,\omega_{\theta\iota\kappa}\,\partial^\kappa f^{\iota\theta} + \frac{2}{3}t_2\,\omega_{\theta\kappa\iota}\,\partial^\kappa f^{\iota\theta} + \frac{2}{3}t_3\,\omega_{\iota\alpha}{}^\alpha\,\partial^\kappa f^\iota{}_\kappa +$$

$$\frac{2}{3}t_3\,\omega_{\iota\lambda}{}^\lambda\,\partial^\kappa f^\iota{}_\kappa - \frac{1}{6}t_2\,\partial^\alpha f^\lambda{}_\kappa\,\partial^\kappa f_{\lambda\alpha} - \frac{1}{6}t_2\,\partial_\kappa f_\theta{}^\lambda\,\partial^\kappa f_\lambda{}^\theta + \frac{1}{6}t_2\,\partial_\kappa f^\lambda{}_\theta\,\partial^\kappa f_\lambda{}^\theta +$$

$$\frac{2}{3}t_3\,\partial^\alpha f^\lambda{}_\alpha\,\partial^\kappa f_{\lambda\kappa} - 4r_3\,\partial^\beta\omega_\iota{}^{\lambda\alpha}\,\partial_\lambda\omega_{\alpha\beta}{}^\iota - \frac{1}{2}r_3\,\partial_\alpha\omega_\lambda{}^\alpha{}_\theta\,\partial^\lambda\omega^{\theta\kappa}{}_\kappa +$$

$$r_5\,\partial_\alpha\omega_\lambda{}^\alpha{}_\theta\,\partial^\lambda\omega^{\theta\kappa}{}_\kappa + \frac{1}{2}r_3\,\partial_\theta\omega_\lambda{}^\alpha{}_\alpha\,\partial^\lambda\omega^{\theta\kappa}{}_\kappa - r_5\,\partial_\theta\omega_\lambda{}^\alpha{}_\alpha\,\partial^\lambda\omega^{\theta\kappa}{}_\kappa$$

Quadratic pole

Pole residue:	$-\dfrac{1}{r_3(2r_3+r_5)(r_3+2r_5)p^2} > 0$
Polarisations:	2

Unitarity conditions

$r_3 < 0 \,\&\&\, (r_5 < -\tfrac{r_3}{2} \,\|\, r_5 > -2r_3) \,\|\, r_3 > 0 \,\&\&\, -2r_3 < r_5 < -\tfrac{r_3}{2}$

(No massive particles)