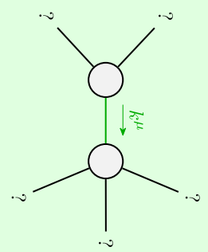

Quadratic pole

Pole residue: $\frac{1}{r_5 t_1^2 p^2} > 0$

Polarisations: 2

Unitarity conditions

$r_5 > 0 \;\&\&\; t_1 < 0 \,||\, t_1 > 0$

(No massive particles)

	$\sigma_{1^+}^{\#1}{}_{\alpha\beta}$	$\sigma_{1^+}^{\#2}{}_{\alpha\beta}$	$\tau_{1^+}^{\#1}{}_{\alpha\beta}$	$\sigma_{1^-}^{\#1}{}_{\alpha}$	$\sigma_{1^-}^{\#2}{}_{\alpha}$	$\tau_{1^-}^{\#1}{}_{\alpha}$	$\tau_{1^-}^{\#2}{}_{\alpha}$
$\sigma_{1^+}^{\#1}{}^{\dagger\alpha\beta}$	$\frac{1}{k^2 r_5}$	$\frac{1}{\sqrt{2}\,(k^2 r_5 + k^4 r_5)}$	$\frac{i}{\sqrt{2}\,(k r_5 + k^3 r_5)}$	0	0	0	0
$\sigma_{1^+}^{\#2}{}^{\dagger\alpha\beta}$	$\frac{1}{\sqrt{2}\,(k^2 r_5 + k^4 r_5)}$	$\frac{6k^2 r_5 + t_1}{2\,(k+k^3)^2 r_5 t_1}$	$\frac{i\,(6k^2 r_5 + t_1)}{2k\,(1+k^2)^2 r_5 t_1}$	0	0	0	0
$\tau_{1^+}^{\#1}{}^{\dagger\alpha\beta}$	$-\frac{i}{\sqrt{2}\,(k r_5 + k^3 r_5)}$	$-\frac{i\,(6k^2 r_5 + t_1)}{2k\,(1+k^2)^2 r_5 t_1}$	$\frac{6k^2 r_5 + t_1}{2\,(1+k^2)^2 r_5 t_1}$	0	0	0	0
$\sigma_{1^-}^{\#1}{}^{\dagger\alpha}$	0	0	0	0	$\frac{\sqrt{2}}{t_1 + 2k^2 t_1}$	0	$\frac{2ik}{t_1 + 2k^2 t_1}$
$\sigma_{1^-}^{\#2}{}^{\dagger\alpha}$	0	0	0	$\frac{\sqrt{2}}{t_1 + 2k^2 t_1}$	$\frac{-2k^2 r_5 + t_1}{(t_1 + 2k^2 t_1)^2}$	0	$-\frac{i\sqrt{2}\,k\,(2k^2 r_5 - t_1)}{(t_1 + 2k^2 t_1)^2}$
$\tau_{1^-}^{\#1}{}^{\dagger\alpha}$	0	0	0	0	0	0	0
$\tau_{1^-}^{\#2}{}^{\dagger\alpha}$	0	0	0	$-\frac{2ik}{t_1 + 2k^2 t_1}$	$\frac{i\sqrt{2}\,k\,(2k^2 r_5 - t_1)}{(t_1 + 2k^2 t_1)^2}$	0	$\frac{-4k^4 r_5 + 2k^2 t_1}{(t_1 + 2k^2 t_1)^2}$

Lagrangian density

$$
\begin{aligned}
&-t_1\,\omega_{\imath}{}^{\alpha\imath}\,\omega_{\kappa\alpha}{}^{\kappa} - \tfrac{1}{3} t_1\,\omega_{\imath}{}^{\kappa\lambda}\,\omega_{\kappa\lambda}{}^{\prime} + \tfrac{1}{3} t_1\,\omega_{\kappa\lambda}{}^{\prime}\,\omega^{\kappa\lambda}{}_{\imath} + f^{\alpha\beta}\,\tau_{\alpha\beta} + \omega^{\alpha\beta\chi}\,\sigma_{\alpha\beta\chi} - \\
&r_5\,\partial_{\imath}\omega^{\kappa\lambda}{}_{\kappa}\partial^{\prime}\omega_{\lambda}{}^{\alpha}{}_{\alpha} - r_5\,\partial_{\alpha}\omega_{\lambda}{}^{\alpha}{}_{\theta}\partial_{\kappa}\omega^{\theta\kappa\lambda} + r_5\,\partial_{\theta}\omega_{\lambda}{}^{\alpha}{}_{\alpha}\partial_{\kappa}\omega^{\theta\kappa\lambda} - r_5\,\partial_{\alpha}\omega_{\lambda}{}^{\alpha}{}_{\theta}\partial_{\kappa}\omega^{\kappa\lambda\theta} + \\
&2 r_5\,\partial_{\theta}\omega_{\lambda}{}^{\alpha}{}_{\alpha}\partial_{\kappa}\omega^{\kappa\lambda\theta} - \tfrac{1}{3} t_1\,\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}{3} t_1\,\partial^{\alpha} f^{\lambda}{}_{\kappa}\partial^{\kappa} f_{\alpha\lambda} + \\
&t_1\,\omega_{\kappa\alpha}{}^{\alpha}\,\partial^{\kappa} f^{\prime}{}_{\imath} + t_1\,\omega_{\kappa\lambda}{}^{\lambda}\,\partial^{\kappa} f^{\prime}{}_{\imath} + 2 t_1\,\partial^{\alpha} f_{\kappa\alpha}\partial^{\kappa} f^{\prime}{}_{\imath} - t_1\,\partial_{\kappa} f^{\lambda}{}_{\lambda}\partial^{\kappa} f^{\prime}{}_{\imath} + \\
&\tfrac{1}{3} t_1\,\omega_{\imath\theta\kappa}\,\partial^{\kappa} f^{\prime\theta} + \tfrac{4}{3} t_1\,\omega_{\imath\kappa\theta}\,\partial^{\kappa} f^{\prime\theta} - \tfrac{1}{3} t_1\,\omega_{\theta\imath\kappa}\,\partial^{\kappa} f^{\prime\theta} + \tfrac{2}{3} t_1\,\omega_{\theta\kappa\imath}\,\partial^{\kappa} f^{\prime\theta} - \\
&t_1\,\omega_{\imath\alpha}{}^{\alpha}\,\partial^{\kappa} f^{\prime}{}_{\kappa} - t_1\,\omega_{\imath\lambda}{}^{\lambda}\,\partial^{\kappa} f^{\prime}{}_{\kappa} + \tfrac{1}{3} t_1\,\partial^{\alpha} f^{\lambda}{}_{\kappa}\partial^{\kappa} f_{\lambda\alpha} + \tfrac{1}{3} t_1\,\partial_{\kappa} f_{\theta}{}^{\lambda}\partial^{\kappa} f_{\lambda}{}^{\theta} + \\
&\tfrac{2}{3} t_1\,\partial_{\kappa} f^{\lambda}{}_{\theta}\partial^{\kappa} f_{\lambda}{}^{\theta} - t_1\,\partial^{\alpha} f^{\lambda}{}_{\alpha}\partial^{\kappa} f_{\lambda\kappa} + r_5\,\partial_{\alpha}\omega_{\lambda}{}^{\alpha}{}_{\theta}\partial^{\lambda}\omega^{\theta\kappa}{}_{\kappa} - r_5\,\partial_{\theta}\omega_{\lambda}{}^{\alpha}{}_{\alpha}\partial^{\lambda}\omega^{\theta\kappa}{}_{\kappa}
\end{aligned}
$$

	$\omega_{1^+}^{\#1}{}_{\alpha\beta}$	$\omega_{1^+}^{\#2}{}_{\alpha\beta}$	$f_{1^+}^{\#1}{}_{\alpha\beta}$	$\omega_{1^-}^{\#1}{}_{\alpha}$	$\omega_{1^-}^{\#2}{}_{\alpha}$	$f_{1^-}^{\#1}{}_{\alpha}$	$f_{1^-}^{\#2}{}_{\alpha}$
$\omega_{1^+}^{\#1}{}^{\dagger\alpha\beta}$	$k^2 r_5 + \frac{t_1}{6}$	$-\frac{t_1}{3\sqrt{2}}$	$-\frac{ikt_1}{3\sqrt{2}}$	0	0	0	0
$\omega_{1^+}^{\#2}{}^{\dagger\alpha\beta}$	$-\frac{t_1}{3\sqrt{2}}$	$\frac{t_1}{3}$	$\frac{ikt_1}{3}$	0	0	0	0
$f_{1^+}^{\#1}{}^{\dagger\alpha\beta}$	$\frac{ikt_1}{3\sqrt{2}}$	$-\frac{1}{3} i k t_1$	$\frac{k^2 t_1}{3}$	0	0	0	0
$\omega_{1^-}^{\#1}{}^{\dagger\alpha}$	0	0	0	$k^2 r_5 - \frac{t_1}{2}$	$\frac{t_1}{\sqrt{2}}$	0	ikt_1
$\omega_{1^-}^{\#2}{}^{\dagger\alpha}$	0	0	0	$\frac{t_1}{\sqrt{2}}$	0	0	0
$f_{1^-}^{\#1}{}^{\dagger\alpha}$	0	0	0	0	0	0	0
$f_{1^-}^{\#2}{}^{\dagger\alpha}$	0	0	0	$-ikt_1$	0	0	0

Source constraints

SO(3) irreps	#
$\sigma_{0^-}^{\#1} == 0$	1
$\tau_{0^+}^{\#2} == 0$	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
$\tau_{2^+}^{\#1\alpha\beta} - 2ik\,\sigma_{2^+}^{\#1\alpha\beta} == 0$	5
Total #:	17

	$\omega_{2^+}^{\#1}{}_{\alpha\beta}$	$f_{2^+}^{\#1}{}_{\alpha\beta}$	$\omega_{2^-}^{\#1}{}_{\alpha\beta\chi}$
$\omega_{2^+}^{\#1}{}^{\dagger\alpha\beta}$	$\frac{t_1}{2}$	$\frac{ikt_1}{\sqrt{2}}$	0
$f_{2^+}^{\#1}{}^{\dagger\alpha\beta}$	$-\frac{ikt_1}{\sqrt{2}}$	$k^2 t_1$	0
$\omega_{2^-}^{\#1}{}^{\dagger\alpha\beta\chi}$	0	0	$\frac{t_1}{2}$

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

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

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