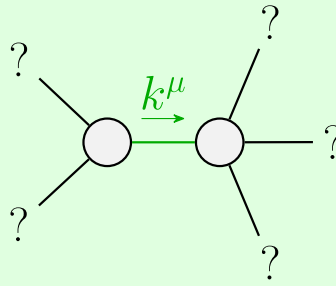


Massive particle

Pole residue:	$-\frac{1}{\alpha_3} > 0$
Polarisations:	1
Square mass:	$-\frac{\alpha_0-4\beta_1}{2\alpha_3} > 0$
Spin:	0
Parity:	Odd



Quadratic pole

Pole residue:	$\frac{1}{s_0} > 0$
Polarisations:	2

Unitarity conditions  
 $\alpha_0 > 0 \ \&\& \ \alpha_3 < 0 \ \&\& \ \beta_1 < \frac{\alpha_0}{4}$

$\sigma_{1+}^{\#1} \dagger^{\alpha\beta}$	$\sigma_{1+}^{\#2} \alpha\beta$	$\tau_{1+}^{\#1} \alpha\beta$	$\sigma_{1-}^{\#1} \alpha$	$\sigma_{1-}^{\#2} \alpha$	$\tau_{1-}^{\#1} \alpha$	$\tau_{1-}^{\#2} \alpha$
0	$\frac{2\sqrt{2}}{(\alpha_0-4\beta_1)(1+k^2)}$	$\frac{2i\sqrt{2}k}{(\alpha_0-4\beta_1)(1+k^2)}$	0	0	0	0
$\frac{2\sqrt{2}}{(\alpha_0-4\beta_1)(1+k^2)}$	$-\frac{2}{(\alpha_0-4\beta_1)(1+k^2)^2}$	$-\frac{2ik}{(\alpha_0-4\beta_1)(1+k^2)^2}$	0	0	0	0
$-\frac{2i\sqrt{2}k}{(\alpha_0-4\beta_1)(1+k^2)}$	$\frac{2ik}{(\alpha_0-4\beta_1)(1+k^2)^2}$	$-\frac{2k^2}{(\alpha_0-4\beta_1)(1+k^2)^2}$	0	0	0	0
0	0	0	0	$-\frac{2\sqrt{2}}{(\alpha_0-4\beta_1)(1+2k^2)}$	0	$-\frac{4ik}{(\alpha_0-4\beta_1)(1+2k^2)}$
0	0	0	$-\frac{2\sqrt{2}}{(\alpha_0-4\beta_1)(1+2k^2)}$	0	0	$-\frac{2i\sqrt{2}k}{(\alpha_0-4\beta_1)(1+2k^2)^2}$
0	0	0	0	0	0	0
0	0	0	$\frac{4ik}{(\alpha_0-4\beta_1)(1+2k^2)}$	$\frac{2i\sqrt{2}k}{(\alpha_0-4\beta_1)(1+2k^2)^2}$	0	$-\frac{4k^2}{(\alpha_0-4\beta_1)(1+2k^2)^2}$

Lagrangian density

$$\begin{aligned}
 & -\frac{1}{2}\alpha_0\omega_{\alpha\chi\beta}\omega^{\alpha\beta\chi}-\frac{1}{2}\alpha_0\omega_{\alpha}^{\alpha\beta}\omega_{\beta}^{\chi}\omega_{\chi}^{\alpha\beta}\omega_{\alpha}^{\chi}\omega_{\beta}^{\chi}- \\
 & 2\beta_1\omega_{\alpha}^{\chi\delta}\omega_{\chi\delta}^{\alpha}-2\beta_1\omega_{\alpha}^{\chi}\omega_{\chi}^{\alpha\beta}\partial_{\beta}f^{\alpha\beta}-2\beta_1\omega_{\alpha}^{\delta}\omega_{\delta}^{\alpha\beta}\partial_{\beta}f^{\alpha\beta}-\alpha_0f^{\alpha\beta}\partial_{\beta}\omega_{\alpha}^{\chi}\omega_{\chi}^{\alpha}+ \\
 & \alpha_0\partial_{\beta}\omega_{\alpha}^{\alpha\beta}+\frac{2}{3}\alpha_3\partial^{\alpha}\omega_{\alpha}^{\beta\gamma}\omega_{\beta\gamma}^{\chi}\partial_{\chi}\omega_{\alpha}^{\beta\gamma}+\frac{2}{3}\alpha_3\partial^{\alpha}\omega_{\alpha}^{\beta\gamma}\omega_{\beta\gamma}^{\chi}\partial_{\chi}\omega_{\alpha}^{\beta\gamma}+\frac{2}{3}\alpha_3\partial^{\alpha}\omega_{\alpha}^{\beta\gamma}\omega_{\beta\gamma}^{\chi}\partial_{\chi}\omega_{\alpha}^{\beta\gamma}+ \\
 & 2\beta_1\omega_{\beta}^{\delta}\omega_{\delta}^{\beta\gamma}\partial_{\gamma}f^{\alpha}-2\beta_1\omega_{\beta}^{\delta}\omega_{\delta}^{\beta\gamma}\partial_{\gamma}f^{\alpha}+\alpha_0f^{\alpha\beta}\partial_{\chi}\omega_{\alpha}^{\chi}\omega_{\beta}^{\chi}- \\
 & \alpha_0f^{\alpha}\partial_{\chi}\omega_{\beta}^{\beta\chi}\omega_{\chi}^{\alpha}-\frac{2}{3}\alpha_3\partial_{\beta}\omega_{\alpha}^{\beta\gamma}\omega_{\gamma}^{\chi}\partial_{\chi}\omega_{\alpha}^{\beta\gamma}-\frac{1}{3}\alpha_3\partial_{\beta}\omega_{\alpha}^{\beta\gamma}\omega_{\gamma}^{\chi}\partial_{\chi}\omega_{\alpha}^{\beta\gamma}+ \\
 & 4\beta_1\omega_{\alpha\chi\beta}\partial^{\chi}f^{\alpha\beta}+\beta_1\partial_{\chi}f_{\beta}^{\delta}\partial^{\chi}f_{\delta}^{\beta}+\beta_1\partial_{\chi}f_{\beta}^{\delta}\partial^{\chi}f_{\delta}^{\beta}+\beta_1\partial_{\chi}f_{\beta}^{\delta}\partial^{\chi}f_{\delta}^{\beta}+ \\
 & \frac{2}{3}\alpha_3\partial_{\chi}\omega_{\alpha}^{\beta\gamma}\omega_{\beta\gamma}^{\chi}\partial_{\delta}f^{\alpha\delta}+\frac{1}{3}\alpha_3\partial_{\chi}\omega_{\alpha}^{\beta\gamma}\omega_{\beta\gamma}^{\chi}\partial_{\delta}f^{\alpha\delta}+4\beta_1\partial^{\beta}f^{\alpha}\partial_{\delta}f_{\alpha}^{\delta}- \\
 & 2\beta_1\partial_{\beta}f_{\chi}^{\beta}\partial_{\delta}f^{\chi\delta}+\frac{2}{3}\alpha_3\partial^{\beta}\omega_{\alpha}^{\delta\gamma}\omega_{\gamma}^{\delta}\partial_{\delta}\omega_{\alpha}^{\delta\gamma}-\frac{2}{3}\alpha_3\partial^{\beta}\omega_{\alpha}^{\delta\gamma}\omega_{\gamma}^{\delta}\partial_{\delta}\omega_{\alpha}^{\delta\gamma}- \\
 & \beta_1\partial^{\chi}f_{\gamma}^{\beta}\partial^{\gamma}f_{\beta\chi}-\beta_1\partial^{\chi}f_{\gamma}^{\beta}\partial^{\gamma}f_{\beta\chi}+\beta_1\partial^{\chi}f_{\gamma}^{\beta}\partial^{\gamma}f_{\beta\chi}+\beta_1\partial^{\chi}f_{\gamma}^{\beta}\partial^{\gamma}f_{\beta\chi}-\beta_1\partial^{\chi}f_{\gamma}^{\beta}\partial^{\gamma}f_{\beta\chi}
 \end{aligned}$$

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

	$\omega_{0+}^{\#1}$	$f_{0+}^{\#1}$	$f_{0+}^{\#2}$	$\omega_{0-}^{\#1}$
$\omega_{0+}^{\#1} \dagger$	$\frac{1}{2}(\alpha_0-4\beta_1)$	$-\frac{i(\alpha_0-4\beta_1)k}{\sqrt{2}}$	0	0
$f_{0+}^{\#1} \dagger$	$\frac{i(\alpha_0-4\beta_1)k}{\sqrt{2}}$	$-4\beta_1k^2$	0	0
$f_{0+}^{\#2} \dagger$	0	0	0	0
$\omega_{0-}^{\#1} \dagger$	0	0	0	$\frac{\alpha_0}{2}-2\beta_1+\alpha_3k^2$

	$\omega_{2+}^{\#1} \alpha\beta$	$f_{2+}^{\#1} \alpha\beta$	$\omega_{2-}^{\#1} \alpha\beta\chi$
$\omega_{2+}^{\#1} \dagger^{\alpha\beta}$	$-\frac{\alpha_0}{4}+\beta_1$	$\frac{i(\alpha_0-4\beta_1)k}{2\sqrt{2}}$	0
$f_{2+}^{\#1} \dagger^{\alpha\beta}$	$-\frac{i(\alpha_0-4\beta_1)k}{2\sqrt{2}}$	$2\beta_1k^2$	0
$\omega_{2-}^{\#1} \dagger^{\alpha\beta\chi}$	0	0	$-\frac{\alpha_0}{4}+\beta_1$

	$\sigma_{2+}^{\#1} \alpha\beta$	$\tau_{2+}^{\#1} \alpha\beta$	$\sigma_{2-}^{\#1} \alpha\beta\chi$
$\sigma_{2+}^{\#1} \dagger^{\alpha\beta}$	$-\frac{16\beta_1}{\alpha_0^2-4\alpha_0\beta_1}$	$\frac{2i\sqrt{2}}{\alpha_0k}$	0
$\tau_{2+}^{\#1} \dagger^{\alpha\beta}$	$-\frac{2i\sqrt{2}}{\alpha_0k}$	$\frac{2}{\alpha_0k^2}$	0
$\sigma_{2-}^{\#1} \dagger^{\alpha\beta\chi}$	0	0	$\frac{1}{-\frac{\alpha_0}{4}+\beta_1}$

Source constraints

SO(3) irreps	#
$\tau_{0+}^{\#2} == 0$	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
Total #:	10

	$\omega_{2+}^{\#1} \alpha\beta$	$f_{2+}^{\#1} \alpha\beta$	$\omega_{2-}^{\#1} \alpha\beta\chi$
$\omega_{2+}^{\#1} \dagger^{\alpha\beta}$	$-\frac{\alpha_0}{4}+\beta_1$	$\frac{i(\alpha_0-4\beta_1)k}{2\sqrt{2}}$	0
$f_{2+}^{\#1} \dagger^{\alpha\beta}$	$-\frac{i(\alpha_0-4\beta_1)k}{2\sqrt{2}}$	$2\beta_1k^2$	0
$\omega_{2-}^{\#1} \dagger^{\alpha\beta\chi}$	0	0	$-\frac{\alpha_0}{4}+\beta_1$

	$\sigma_{0+}^{\#1}$	$\tau_{0+}^{\#1}$	$\tau_{0+}^{\#2}$	$\sigma_{0-}^{\#1}$
$\sigma_{0+}^{\#1} \dagger$	$\frac{8\beta_1}{\alpha_0^2-4\alpha_0\beta_1}$	$-\frac{i\sqrt{2}}{\alpha_0k}$	0	0
$\tau_{0+}^{\#1} \dagger$	$\frac{i\sqrt{2}}{\alpha_0k}$	$-\frac{1}{\alpha_0k^2}$	0	0
$\tau_{0+}^{\#2} \dagger$	0	0	0	0
$\sigma_{0-}^{\#1} \dagger$	0	0	0	$\frac{2}{\alpha_0-4\beta_1+2\alpha_3k^2}$

	$\omega_{1+}^{\#1} \alpha\beta$	$\omega_{1+}^{\#2} \alpha\beta$	$f_{1+}^{\#1} \alpha\beta$	$\omega_{1-}^{\#1} \alpha$	$\omega_{1-}^{\#2} \alpha$	$f_{1-}^{\#1} \alpha$	$f_{1-}^{\#2} \alpha$
$\omega_{1+}^{\#1} \dagger^{\alpha\beta}$	$\frac{1}{4}(\alpha_0-4\beta_1)$	$\frac{\alpha_0-4\beta_1}{2\sqrt{2}}$	$\frac{i(\alpha_0-4\beta_1)k}{2\sqrt{2}}$	0	0	0	0
$\omega_{1+}^{\#2} \dagger^{\alpha\beta}$	$\frac{\alpha_0-4\beta_1}{2\sqrt{2}}$	0	0	0	0	0	0
$f_{1+}^{\#1} \dagger^{\alpha\beta}$	$-\frac{i(\alpha_0-4\beta_1)k}{2\sqrt{2}}$	0	0	0	0	0	0
$\omega_{1-}^{\#1} \dagger^{\alpha}$	0	0	0	$\frac{1}{4}(\alpha_0-4\beta_1)$	$-\frac{\alpha_0-4\beta_1}{2\sqrt{2}}$	0	$-\frac{1}{2}i(\alpha_0-4\beta_1)k$
$\omega_{1-}^{\#2} \dagger^{\alpha}$	0	0	0	$-\frac{\alpha_0-4\beta_1}{2\sqrt{2}}$	0	0	0
$f_{1-}^{\#1} \dagger^{\alpha}$	0	0	0	0	0	0	0
$f_{1-}^{\#2} \dagger^{\alpha}$	0	0	0	$\frac{1}{2}i(\alpha_0-4\beta_1)k$	0	0	0