



Quadratic pole

Pole residue: $\frac{1}{g_0} > 0$

Polarisations: 2

$\alpha_0 > 0$
Unitarity conditions

(No massive particles)

Lagrangian density

$$-\frac{1}{2} \alpha_0 \omega_{\alpha\zeta\beta} \omega^{\alpha\beta\zeta} - \frac{1}{2} \alpha_0 \omega^{\alpha\beta}{}_{\alpha} \omega_{\beta}{}^{\zeta}{}_{\zeta} - \alpha_0 f^{\alpha\beta} \partial_{\beta} \omega_{\alpha}{}^{\zeta}{}_{\zeta} +$$

$$\alpha_0 \partial_{\beta} \omega^{\alpha\beta}{}_{\alpha} + \alpha_0 f^{\alpha\beta} \partial_{\zeta} \omega_{\alpha}{}^{\zeta}{}_{\beta} - \alpha_0 f^{\alpha}{}_{\alpha} \partial_{\zeta} \omega^{\beta\zeta}{}_{\beta}$$

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

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

Source constraints

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

$\omega_{0+}^{\#1}$	$f_{0+}^{\#1}$	$f_{0+}^{\#2}$	$\omega_{0-}^{\#1}$
$\frac{\alpha_0}{2}$	$-\frac{i\alpha_0 k}{\sqrt{2}}$	0	0
$\frac{i\alpha_0 k}{\sqrt{2}}$	0	0	0
0	0	0	$\frac{\alpha_0}{2}$

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

$\sigma_{0+}^{\#1}$	$\tau_{0+}^{\#1}$	$\tau_{0+}^{\#2}$	$\sigma_{0-}^{\#1}$
0	$-\frac{i\sqrt{2}}{\alpha_0 k}$	0	0
$\frac{i\sqrt{2}}{\alpha_0 k}$	$-\frac{1}{\alpha_0 k^2}$	0	0
0	0	0	0
0	0	0	$\frac{2}{\alpha_0}$

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

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