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

	$\omega_{0}^{\sharp 1}$	$f_{0}^{#1}$	$f_{0}^{#2}$	$\omega_0^{\sharp 1}$
$\omega_{0}^{\#1}$ †	t_3	$-i \sqrt{2} kt_3$	0	0
$f_{0}^{#1}\dagger$	$i\sqrt{2} kt_3$	$2k^2t_3$	0	0
$f_{0}^{#2} \dagger$	0	0	0	0
$\omega_{0}^{\#1}$ †	0	0	0	$k^2 r_2 + t_2$

	#	1	1	ω	κ	κ	2	16
Source constraints	SO(3) irreps	$t_0^{#2} = 0$	$\tau_0^{\#1} - 2 \bar{l} k \sigma_0^{\#1} == 0$	$t_1^{\#2}{}^{\alpha} + 2ik \sigma_1^{\#2}{}^{\alpha} == 0$	$t_{1}^{\#1\alpha} == 0$	$t_1^{\#1}{}^{\alpha\beta}+ik\;\sigma_1^{\#2}{}^{\alpha\beta}==0$	$\tau_{2+}^{\#1}\alpha\beta - 2ik \sigma_{2+}^{\#1}\alpha\beta == 0$	Total #:

Lagrangian density	$-\frac{1}{3}t_{1} \omega_{,\alpha}^{\ \alpha'} \omega_{\kappa\alpha}^{\ \ \kappa} + \frac{2}{3}t_{3} \omega_{,\alpha}^{\ \alpha'} \omega_{\kappa\alpha}^{\ \ \kappa} - \frac{1}{3}t_{1} \omega_{,\kappa}^{\ \kappa\lambda} \omega_{\kappa\lambda}^{\ \ \kappa\lambda} + \frac{2}{3}t_{2} \omega_{,\kappa}^{\ \kappa\lambda} \omega_{\kappa\lambda}^{\ \ \kappa\lambda} +$	$rac{1}{3}t_1\;\omega_{\kappa\lambda}^{\prime}\;\omega^{\kappa\lambda}^{\prime}+rac{1}{3}t_2\;\omega_{\kappa\lambda}^{\prime}\;\omega^{\kappa\lambda}^{\prime}+f^{lphaeta}\; au_{etaeta}^{}\; au_{etaeta}^{}+\omega^{lphaeta\chi}\;\sigma_{lphaeta\chi}^{}+$	$rac{2}{3}r_2\partial^{eta}\omega^{etalpha}_{\kappa}\partial_{eta}\omega^{\kappa}_{\beta}^{\kappa} - rac{1}{3}r_2\partial_{eta}\omega^{\kappa}_{\beta}^{\kappa}\partial_{\kappa}\omega^{lphaetaeta}^{} - rac{2}{3}r_2\partial_{eta}\omega^{\kappa}_{\beta}^{\kappa}\partial_{\kappa}\omega^{etalpha}^{\kappa} - rac{1}{3}r_2\partial_{eta}\omega^{\kappa}_{\beta}^{\kappa}$	$\frac{1}{3}t_1\partial^{\alpha}f_{\theta k}\partial^{\kappa}f_{\alpha}^{\ \theta} + \frac{1}{6}t_2\partial^{\alpha}f_{\theta k}\partial^{\kappa}f_{\alpha}^{\ \theta} - \frac{2}{3}t_1\partial^{\alpha}f_{\kappa\theta}\partial^{\kappa}f_{\alpha}^{\ \theta} - \frac{1}{6}t_2\partial^{\alpha}f_{\kappa\theta}\partial^{\kappa}f_{\alpha}^{\ \theta} -$	$\frac{1}{3}t_1\partial^{\alpha}f^{\lambda}_{\kappa}\partial^{\kappa}f_{\lambda} + \frac{1}{6}t_2\partial^{\alpha}f^{\lambda}_{\kappa}\partial^{\kappa}f_{\lambda} + \frac{1}{3}t_1\ \omega_{\kappa\alpha}^{\alpha}\partial^{\kappa}f'_{\prime} - \frac{2}{3}t_3\ \omega_{\kappa\alpha}^{\alpha}\partial^{\kappa}f'_{\prime} +$	$\frac{1}{3}t_{1}\ \omega_{\kappa\lambda}^{\ \ \lambda}\ \partial^{\kappa}f'_{\ \ \prime} - \frac{2}{3}t_{3}\ \omega_{\kappa\lambda}^{\ \ \lambda}\ \partial^{\kappa}f'_{\ \ \prime} + \frac{2}{3}t_{1}\ \partial^{\alpha}f_{\ \kappa\alpha}\ \partial^{\kappa}f'_{\ \ \prime} - \frac{4}{3}t_{3}\ \partial^{\alpha}f_{\ \kappa\alpha}\ \partial^{\kappa}f'_{\ \ \prime} -$	$\frac{1}{3}t_1\partial_\kappa f^_\lambda\partial^\kappa f'{}_l + \frac{2}{3}t_3\partial_\kappa f^_\lambda\partial^\kappa f'{}_l + \frac{1}{3}t_1\ \omega_{l\theta\kappa}\ \partial^\kappa f^{l\theta} + \frac{1}{3}t_2\ \omega_{l\theta\kappa}\ \partial^\kappa f^{l\theta} +$	$rac{4}{3}t_1\;\omega_{_{IK} heta}\;\partial^{\kappa}f^{' heta}-rac{2}{3}t_2\;\omega_{_{IK} heta}\;\partial^{\kappa}f^{' heta}-rac{1}{3}t_1\;\omega_{ heta_{IK}}\;\partial^{\kappa}f^{' heta}-rac{1}{3}t_2\;\omega_{ heta_{IK}}\;\partial^{\kappa}f^{' heta}+$	$\frac{2}{3}t_{1}\ \omega_{\theta\kappa_{l}}\ \partial^{\kappa}f^{'\theta} + \frac{2}{3}t_{2}\ \omega_{\theta\kappa_{l}}\ \partial^{\kappa}f^{'\theta} - \frac{1}{3}t_{1}\ \omega_{'\alpha}^{\ \alpha}\ \partial^{\kappa}f^{'}_{\ \kappa} + \frac{2}{3}t_{3}\ \omega_{'\alpha}^{\ \alpha}\ \partial^{\kappa}f^{'}_{\ \kappa} -$	$\frac{1}{3}t_{1}\ \omega_{,\lambda}^{\ \lambda}\ \partial^{\kappa}f'_{\ \kappa} + \frac{2}{3}t_{3}\ \omega_{,\lambda}^{\ \lambda}\ \partial^{\kappa}f'_{\ \kappa} + \frac{1}{3}t_{1}\ \partial^{\alpha}f^{\lambda}_{\ \kappa}\ \partial^{\kappa}f_{\lambda\alpha} - \frac{1}{6}t_{2}\ \partial^{\alpha}f^{\lambda}_{\ \kappa}\ \partial^{\kappa}f_{\lambda\alpha} +$	$\frac{1}{3}t_1\partial_\kappa f_{\beta}^{\lambda}\partial^\kappa f_{\lambda}^{\theta} - \frac{1}{6}t_2\partial_\kappa f_{\beta}^{\lambda}\partial^\kappa f_{\lambda}^{\theta} + \frac{2}{3}t_1\partial_\kappa f^{\lambda}_{\theta}\partial^\kappa f_{\lambda}^{\theta} + \frac{1}{6}t_2\partial_\kappa f^{\lambda}_{\theta}\partial^\kappa f_{\lambda}^{\theta} -$	$rac{1}{3}t_1\partial^{lpha}f^{\lambda}_{\ \ lpha}\partial^{\kappa}f_{\lambda\kappa}+rac{2}{3}t_3\partial^{lpha}f^{\lambda}_{\ \ lpha}\partial^{\kappa}f_{\lambda\kappa}+rac{1}{3}r_2\partial_{\kappa}\omega^{lphaeta heta}\partial^{\kappa}\omega_{lphaeta heta}+$	$\frac{2}{3}r_2\partial_\kappa\omega^{ hetalphaeta}\partial^\kappa\omega_{lphaetaeta}-rac{2}{3}r_2\partial^eta\omega^{lpha\lambda}\partial_\lambda\omega^{lpha'}+rac{2}{3}r_2\partial^eta\omega^{\lambdalpha}\partial_\lambda\omega^{lpha'}$
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	$\sigma_0^{\#1}$	$ au_{0}^{\#1}$	$ au_{0}^{\#2}$	$\sigma_0^{\#1}$
$\sigma_{0}^{\#1}$ †	$\frac{1}{(1+2k^2)^2t_3}$	$-\frac{i \sqrt{2} k}{(1+2k^2)^2 t_3}$	0	0
$\tau_{0}^{\#1}$ †	$\frac{i\sqrt{2} k}{(1+2k^2)^2 t_3}$	$\frac{2k^2}{(1+2k^2)^2t_3}$	0	0
$\tau_{0}^{\#2}$ †	0	0	0	0
$\sigma_0^{\sharp_1}$ †	0	0	0	$\frac{1}{k^2 r_2 + t_2}$

	$\omega_{2}^{\#1}{}_{lphaeta}$	$f_{2}^{\#1}{}_{lphaeta}$	$\omega_{2^{-}\alpha\beta\chi}^{\#1}$
$\omega_{2}^{\sharp 1} \dagger^{lphaeta}$	<u>t</u> 1 2	$-\frac{ikt_1}{\sqrt{2}}$	0
$f_{2}^{#1} \dagger^{\alpha\beta}$	$\frac{i k t_1}{\sqrt{2}}$	$k^2 t_1$	0
$ u_2^{\#1} \dagger^{lphaeta\chi}$	0	0	<u>t</u> 1 2

	$\omega_{1}^{\#1}{}_{lphaeta}$	$\omega_{1^{+}lphaeta}^{ ext{#2}}$	$f_{1}^{\#1}{}_{\alpha\beta}$	$\omega_{1-lpha}^{\#1}$	$\omega_1^{\#2}{}_{lpha}$	$f_{1-\alpha}^{\#1}$	$f_{1-\alpha}^{\#2}$
$\omega_1^{\sharp 1} \dagger^{lpha eta}$	$\frac{1}{6}(t_1+4t_2)$	$-\frac{t_1-2t_2}{3\sqrt{2}}$	$-\frac{ik(t_1-2t_2)}{3\sqrt{2}}$	0	0	0	0
$\omega_{1}^{\#2}\dagger^{lphaeta}$	$-\frac{t_1-2t_2}{3\sqrt{2}}$	<u>t1+t2</u> 3	$\frac{1}{3}\bar{l}k(t_1+t_2)$	0	0	0	0
$f_{1}^{#1} \dagger^{\alpha\beta}$	$\frac{i k (t_1 - 2 t_2)}{3 \sqrt{2}}$	$-\frac{1}{3}ik(t_1+t_2)$	$\frac{1}{3}k^2(t_1+t_2)$	0	0	0	0
$\omega_{1}^{\sharp 1}\dagger^{lpha}$	0	0	0	$\frac{1}{6}(t_1+4t_3)$	<u>t₁-2t₃</u> 3 √2	0	$\frac{1}{3} i k (t_1 - 2 t_3)$
$\omega_1^{\#2} \dagger^{lpha}$	0	0	0	$\frac{t_1 - 2t_3}{3\sqrt{2}}$	<u>t₁+t₃</u> 3	0	$\frac{1}{3}\bar{l}\sqrt{2}k(t_1+t_3)$
$f_{1}^{#1} \dagger^{\alpha}$	0	0	0	0	0	0	0
$f_{1}^{#2} \dagger^{\alpha}$	0	0	0	$-\frac{1}{3} \bar{i} k (t_1 - 2 t_3)$	$-\frac{1}{3}i\sqrt{2}k(t_1+t_3)$	0	$\frac{2}{3}k^2(t_1+t_3)$

7	$\sigma_{1+\alpha\beta}^{\#2} \qquad \tau_{1+\alpha\beta}^{\#1}$ $\sqrt{2} (t_1 - 2t_2) \qquad i \sqrt{2} k(t_1 - 2t_2)$	$\sigma_{1}^{\#1}{}_{lpha}$	$\sigma_{1}^{\#2}$	$t_{1^-}^{\#1}\alpha$	$ au_{1}^{\#2}$
	$3(1+k^2)t_1t_2$	0	0	0	0
$\frac{t_1+4t_2}{3(1+k^2)^2t_1t_2} \left \frac{ik}{3(1+k^2)^2} \right $	$\frac{i k (t_1 + 4t_2)}{3 (1 + k^2)^2 t_1 t_2}$	0	0	0	0
$\frac{ik(t_1+4t_2)}{3(1+k^2)^2t_1t_2} \frac{k^2(t_1+t_2)}{3(1+t_2)^2}$	$\frac{k^2 (t_1 + 4t_2)}{3 (1 + k^2)^2 t_1 t_2}$	0	0	0	0
0	0	$\frac{2(t_1+t_3)}{3t_1t_3}$	$-\frac{\sqrt{2} (t_1 - 2t_3)}{3(1 + 2k^2)t_1t_3}$	0	$-\frac{2ikt_1-4ikt_3}{3t_1t_3+6k^2t_1t_3}$
0	0	$-\frac{\sqrt{2} (t_1-2t_3)}{3(1+2k^2)t_1t_3}$	$\frac{t_1+4t_3}{3(1+2k^2)^2t_1t_3}$	0	$\frac{i\sqrt{2}k(t_1+4t_3)}{3(1+2k^2)^2t_1t_3}$
0	0	0	0	0	0
0	0	$\frac{2ikt_1-4ikt_3}{3t_1t_3+6k^2t_1t_3}$	$-\frac{i\sqrt{2}k(t_1+4t_3)}{3(1+2k^2)^2t_1t_3}$	0	$\frac{2k^2(t_1+4t_3)}{3(1+2k^2)^2t_1t_3}$

Massive partic	le
Pole residue:	$-\frac{1}{r_2} > 0$
Polarisations:	1
Square mass:	$-\frac{t_2}{r_2} > 0$
Spin:	0
Parity:	Odd
	Pole residue: Polarisations: Square mass: Spin:

× / 0 % 0 + < 0	Unitarity conditions	(No massless particles
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