$\tau_{1}^{\#2}{}_{\alpha}$	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	$-\frac{4k^2}{(\alpha_{0}-4\beta_{1})(1+2k^2)^2}$
$\tau_{1}^{\#1}{}_{\alpha}$	0	0	0	0	0	0	0
$\sigma_{1}^{\#2}{}_{\alpha}$	0	0	0	$-\frac{2\sqrt{2}}{(\alpha_0-4\beta_1)(1+2k^2)}$	$-\frac{2}{(\alpha_0-4\beta_1)(1+2k^2)^2}$	0	$\frac{2 i \sqrt{2} k}{(\alpha_0 - 4 \beta_1) (1 + 2 k^2)^2}$
$\sigma_{1^{-}\alpha}^{\#1}$	0	0	0	0	$-\frac{2\sqrt{2}}{(\alpha_0-4\beta_1)(1+2k^2)}$	0	$\frac{4ik}{(\alpha_0-4\beta_1)(1+2k^2)}$
$\tau_{1}^{\#1}{}_{\alpha\beta}$	$\frac{2i\sqrt{2}k}{(\alpha_0-4\beta_1)(1+k^2)}$	$-\frac{2ik}{(\alpha_0-4\beta_1)(1+k^2)^2}$	$-\frac{2 k^2}{(\alpha_0 - 4 \beta_1)(1 + k^2)^2}$	0	0	0	0
$\sigma_{1}^{\#2}_{+}$	$\frac{2\sqrt{2}}{(\alpha_0-4\beta_1)(1+k^2)}$	$-\frac{2}{(\alpha_0-4\beta_1)(1+k^2)^2}$	-	0	0	0	0
$\sigma_{1}^{\#1}{}_{\alpha\beta}$	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
$\sigma_1^{\#}$	$\sigma_{1+}^{\#1} + ^{\alpha eta}$	$\sigma_{1}^{#2} + \tau^{\alpha\beta}$	$\tau_{1}^{\#1} + \alpha \beta$	$\sigma_{1}^{\#1} +^{lpha}$	$\sigma_{1}^{\#2} +^{\alpha}$	$\tau_{1}^{\#1} + ^{\alpha}$	$\tau_1^{\#2} + \alpha$

		$\omega_{2}^{\#1}$	αβ		$f_{2}^{\#1}_{\alpha}$	в	ω	#1 2 αβ	χ	
$\omega_{2}^{\#1}$	$+^{\alpha\beta}$	$-\frac{\alpha_0}{4}$ +	$-eta_1$	Ī	$(\alpha_0 - 4 \beta_1)$ $(\alpha_0 - 4 \beta_1)$	<u>) k</u>		0		
$f_{2}^{#1}$	† <sup>αβ</sup>	$-\frac{i(\alpha_0-4)}{2}$	$\frac{\beta_1)k}{2}$		$2 \beta_1 k$	2		0		
$\omega_2^{\#1}$ .	$\dagger^{\alpha\beta\chi}$	0			0		- a	<sup>60</sup> + £	$\beta_1$	
$f_{1^-}^{\#2} \alpha$	0	0	0		$-\frac{1}{2}\tilde{I}\left(\alpha_{0}-4\beta_{1}\right)k$	Û	Þ	0	(	၁

0

0

0

 $\frac{\alpha_0-4\beta_1}{2\sqrt{2}}$ 

 $\frac{1}{4} (\alpha_0 - 4 \beta_1)$ 

 $f_{1^-}^{\#1}{}_{lpha}$ 

 $f_{1}^{\#1}{}_{\alpha\beta}$ 

 $\omega_1^{\#2}$ 

0

0

0

0

0

 $\omega_1^{\#2} + ^{lphaeta}$ 

0

0

0

0

 $f_1^{\#1} +^{\alpha\beta}$ 

 $\frac{\alpha_0 - 4 \beta_1}{2 \sqrt{2}}$   $-\frac{i(\alpha_0 - 4 \beta_1)k}{2 \sqrt{2}}$ 

0

 $\frac{\alpha_0-4\beta_1}{2\sqrt{2}}$ 

 $\frac{1}{4} (\alpha_0 - 4 \beta_1)$ 

0

0

0

 $\omega_{1}^{\#1} \dagger^{\alpha}$ 

	$\sigma_{2^{+}\alpha\beta}^{\#1}$	$\tau_{2}^{\#1}{}_{\alpha\beta}$	$\sigma_{2}^{\#1}{}_{\alpha\beta\chi}$
$\sigma_{2}^{\#1} \dagger^{\alpha\beta}$	$-\frac{16\beta_1}{\alpha_0^2-4\alpha_0\beta_1}$	$\frac{2i\sqrt{2}}{\alpha_0 k}$	0
$\tau_{2}^{\#1} \dagger^{\alpha\beta}$	$-\frac{2i\sqrt{2}}{\alpha_0 k}$	$\frac{2}{\alpha_0 k^2}$	0
$\sigma_2^{\#1} \dagger^{\alpha\beta\chi}$	0	0	$\frac{1}{-\frac{\alpha_0}{4} + \beta_1}$
•			

0	0	0	$\frac{SO(1)}{\tau_0^{\#2}} = \frac{SO(1)}{\tau_1^{\#2}}$
0	0	0	$ au_{1}^{\#_{1}}$
0	0	0	$\frac{\tau_1^{\#10}}{\text{Tota}}$
$-\frac{\alpha_0-4\beta_1}{2\sqrt{2}}$	0	$\frac{1}{2}$ $\vec{i}$ ( $\alpha_0$ - 4 $\beta_1$ ) $k$	$\omega_{0^{-}}^{\#1}$
0	0	0	$f_{0}^{#2}$
0	0	0	$f_{0}^{\#1}$
0	0	0	$\omega_{0}^{\#1}$
$\omega_1^{\#2} +^{\alpha}$	$f_{1^{\bar{-}}}^{\#1} +^{\alpha}$	$f_1^{\#2} +^{\alpha}$	

SO(3) irreps	#
$\tau_{0^{+}}^{\#2} == 0$	1
$\tau_{1}^{\#2\alpha} + 2 i k \sigma_{1}^{\#2\alpha} == 0$	თ
$\tau_{1}^{\#1\alpha} == 0$	3
$\frac{\tau_{1+}^{\#1}\alpha\beta}{\tau_{1+}^{\#1}\alpha\beta} + ik \sigma_{1+}^{\#2}\alpha\beta} == 0$	3
Total #:	10

0

0

 $-4 \beta_1 k^2$ 

 $\frac{i(\alpha_0-4\beta_1)k}{\sqrt{2}}$ 

 $f_0^{\#1}$  †

 $-2\beta_1 + \alpha_6 k^2$ 

2 σ<sub>0</sub>

 $\frac{1}{2} (\alpha_0 - 4 \beta_1)$ 

0

0

0

0

0

0

 $f_{0}^{#2} + \omega_{0}^{#1} + \omega_{0}^{#1}$ 

Source constraints

Lagrangian density $-\frac{1}{2}\alpha_0  \omega_{\alpha\chi\beta}  \omega^{\alpha\beta\chi} - \frac{1}{2}\alpha_0  \omega^{\alpha\beta}  \omega_{\chi}^{\chi} + 2\beta_1  \omega^{\alpha\beta}  \omega_{\chi}^{\chi} - 2\beta_1  \omega_{\chi}^{\chi\delta} - 2\beta_1  \omega_{\chi}^{\chi\delta} - 2\beta_1  \omega_{\chi}^{\chi\delta} - 2\beta_1  \omega_{\chi}^{\delta} - 2\beta_1$	$2\beta_{1}\partial_{\beta}f^{X}_{\lambda}\partial^{\beta}f^{\alpha}_{\alpha} + \alpha_{0}f^{\alpha\beta}\partial_{x}\omega_{\alpha}^{X}_{\beta} - \alpha_{0}f^{\alpha}\partial_{x}\omega^{\beta\chi}_{\beta} +$ $4\beta_{1}\omega_{\alpha\chi\beta}\partial^{\chi}f^{\alpha\beta} + \beta_{1}\partial_{\chi}f^{\beta}_{\beta}\partial^{\chi}f^{\beta}_{\delta} + \beta_{1}\partial_{\chi}f^{\beta}_{\beta}\partial^{\chi}f^{\beta}_{\delta} +$ $4\beta_{1}\partial^{\beta}f^{\alpha}_{\alpha}\partial_{\delta}f^{\beta}_{\beta} - 2\beta_{1}\partial_{\beta}f^{\beta}_{\chi}\partial_{\delta}f^{\chi\delta} + \frac{2}{3}\alpha_{6}\partial_{\beta}\omega^{\alpha\beta}_{\alpha}\partial_{\delta}\omega^{\chi\delta}_{\chi} -$
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	$\sigma_{0^+}^{\sharp 1}$	$ au_{0^{+}}^{#1}$	$ au_{0}^{\#2}$	$\sigma_0^{\sharp 1}$
$\sigma_{0}^{\#1}$ †	$\frac{8\beta_1}{\alpha_0^2 - 4\alpha_0\beta_1 + 8\alpha_6\beta_1k^2}$	$-\frac{i\sqrt{2}(\alpha_0-4\beta_1)}{\alpha_0(\alpha_0-4\beta_1)k+8\alpha_6\beta_1k^3}$	0	0
$\tau_{0}^{\#1}$ †	$\frac{i \sqrt{2} (\alpha_0 - 4 \beta_1)}{\alpha_0 (\alpha_0 - 4 \beta_1) k + 8 \alpha_6 \beta_1 k^3}$	$-\frac{\alpha_0 - 4 \beta_1 + 2 \alpha_6 k^2}{k^2 (\alpha_0^2 - 4 \alpha_0 \beta_1 + 8 \alpha_6 \beta_1 k^2)}$	0	0
$\tau_{0}^{\#2}$ †	0	0	0	0
$\sigma_{0}^{\sharp 1}$ †	0	0	0	$\frac{2}{\alpha_0 - 4 \beta_1}$

Lagrangian density $-\frac{1}{2}\alpha_0\omega_{\alpha\chi\beta}\omega^{\alpha\beta\chi} - \frac{1}{2}\alpha_0\omega^{\alpha\beta}_{\alpha}\omega^{\chi}_{\beta} + 2\beta_1\omega^{\alpha\beta}_{\alpha}\omega^{\chi}_{\beta} - \frac{1}{2}\omega^{\alpha\beta}_{\beta}\omega^{\alpha\beta}_{\beta} - \frac{1}{2}\omega^{\alpha\beta}_{\beta}\omega^{\beta}_{\beta} - \frac{1}{2}\omega^{\alpha\beta}_{\beta}\omega^{\beta}_{\beta} - \frac{1}{2}\omega^{\alpha\beta}_{\beta}\omega^{\beta}_{\beta} - \frac{1}{2}\omega^{\alpha\beta}_{\beta}\omega^{\beta}_{\beta} - \frac{1}{2}\omega^{\alpha\beta}_{\beta}\omega^{\beta}_{\beta} - \frac{1}{2}\omega^{\beta}_{\beta}\omega^{\beta}_{\beta} - \frac{1}{2}\omega^{\beta}_{\beta}\omega^{\beta}_{$	$2\beta_1 \omega_{\alpha}^{X\delta} \omega_{\chi\delta}^{\alpha} - 2\beta_1 \omega_{\alpha}^{X} \partial_{\beta} f^{\alpha\beta} - 2\beta_1 \omega_{\alpha}^{\delta} \partial_{\beta} f^{\alpha\beta} -$ $\alpha_0 f^{\alpha\beta} \partial_{\beta} \omega_{\alpha}^{X} + \alpha_0 \partial_{\beta} \omega^{\alpha\beta}_{\alpha} + 2\beta_1 \omega_{\beta}^{X} \partial^{\beta} f^{\alpha}_{\alpha} + 2\beta_1 \omega_{\beta}^{\delta} \partial^{\beta} f^{\alpha}_{\alpha} -$	$2 \beta_1 \partial_{\beta} f_{\chi}^{X} \partial^{\beta} f_{\alpha}^{\alpha} + \alpha_0 f^{\alpha\beta} \partial_{\chi} \omega_{\alpha}^{X} \beta_{\beta} - \alpha_0 f_{\alpha}^{\alpha} \partial_{\chi} \omega^{\beta \chi} \beta_{\beta} + \beta_1 \partial_{\chi} f_{\beta}^{\beta} \partial^{\chi} f_{\beta}^{\beta} + \beta_1 \partial_{\chi} f_{\beta}^{\beta} \partial^{\chi} f_{\beta}^{\beta} + \beta_1 \partial_{\chi} f_{\beta}^{\delta} \partial^{\chi} f_{\beta}$	$4 \beta_1 \partial^{\beta} f^{\alpha}_{\ \alpha} \partial_{\delta} f^{\delta}_{\ \beta} - 2 \beta_1 \partial_{\beta} f^{\ K}_{\ \chi} \partial_{\delta} f^{K\delta} + \frac{2}{3} \alpha_6 \partial_{\beta} \omega^{\alpha\beta}_{\ \alpha} \partial_{\delta} \omega^{K\delta}_{\ \chi} - \beta_1 \partial^{\chi} f^{\beta}_{\ \zeta} \partial_{\zeta} f^{\kappa}_{\ \chi} + \beta_1 \partial^{\chi} f_{\delta\zeta} \partial^{\zeta} f^{\delta}_{\ \chi} - \beta_1 \partial^{\chi} f_{\zeta\delta} \partial^{\zeta} f^{\delta}_{\ \chi}$	Added source term: $\left f^{lphaeta}\; \iota_{lphaeta} + \omega^{lphaeta\chi}\; \sigma_{lphaeta\chi} ight $