Particle spectrograph

Wave operator and propagator

SO(3) irreps	Fundamental fields	Multiplicities
$\tau_{0+}^{\#2} == 0$	$\partial_{\beta}\partial_{\alpha}\tau^{\alpha\beta} == 0$	1
$\tau_0^{\#1} - 2 i k \sigma_0^{\#1} == 0$	$\partial_{\beta}\partial_{\alpha}\tau^{\alpha\beta} == \partial_{\beta}\partial^{\beta}\tau^{\alpha}_{\alpha} + 2\partial_{\chi}\partial^{\chi}\partial_{\beta}\sigma^{\alpha\beta}_{\alpha}$	1
$\tau_{1}^{\#2}{}^{\alpha} + 2ik \sigma_{1}^{\#2}{}^{\alpha} == 0$	$\partial_{\chi}\partial_{\beta}\partial^{\alpha}t^{\beta\chi} == \partial_{\chi}\partial^{\chi}\partial_{\beta}t^{\alpha\beta} + 2\partial_{\delta}\partial^{\delta}\partial_{\chi}\partial_{\beta}\sigma^{\alpha\beta\chi}$	м
$\tau_{1}^{\#1}{}^{\alpha} == 0$	$\partial_{\chi}\partial_{\beta}\partial^{\alpha}\tau^{\beta\chi} == \partial_{\chi}\partial^{\chi}\partial_{\beta}\tau^{\beta\alpha}$	К
$\tau_1^{\#1}{}^{\alpha\beta} + ik \ \sigma_1^{\#2}{}^{\alpha\beta} == 0$	$\partial_{\chi}\partial^{\alpha}\tau^{\beta\chi} + \partial_{\chi}\partial^{\beta}\tau^{\chi\alpha} + \partial_{\chi}\partial^{\chi}\tau^{\alpha\beta} +$	М
	$2 \partial_{\delta} \partial_{\chi} \partial^{\alpha} \sigma^{\beta \chi \delta} + 2 \partial_{\delta} \partial^{\delta} \partial_{\chi} \sigma^{\alpha \beta \chi} = =$	
	$\partial_{\chi}\partial^{\alpha}t^{\chi\beta} + \partial_{\chi}\partial^{\beta}t^{\alpha\chi} +$	
	$\partial_{\chi}\partial^{\chi}\tau^{\beta\alpha} + 2\partial_{\delta}\partial_{\chi}\partial^{\beta}\sigma^{\alpha\chi\delta}$	
$\tau_{2+}^{\#1}\alpha\beta - 2ik \sigma_{2+}^{\#1}\alpha\beta == 0$	$t_{2+}^{\#1}\alpha\beta - 2\bar{\imath}k \ \sigma_{2+}^{\#1}\alpha\beta == 0 \ -\bar{\imath}(4\partial_{\delta}\partial_{\chi}\partial^{\beta}\partial^{\alpha}\tau^{\chi\delta} + 2\partial_{\delta}\partial^{\delta}\partial^{\beta}\sigma^{\tau\chi}_{\chi} -$	5
	$3 \partial_{\delta} \partial_{\chi} \partial^{\alpha} t^{\beta \chi} - 3 \partial_{\delta} \partial^{\delta} \partial_{\chi} \partial^{\alpha} t^{\chi \beta} -$	
	$3 \partial_{\delta} \partial^{\delta} \partial_{\chi} \partial^{\beta} \tau^{\alpha \chi} - 3 \partial_{\delta} \partial^{\delta} \partial_{\chi} \partial^{\beta} \tau^{\chi \alpha} +$	
	$3 \partial_{\delta} \partial^{\delta} \partial_{\chi} \partial^{\chi} \tau^{\alpha\beta} + 3 \partial_{\delta} \partial^{\delta} \partial_{\chi} \partial^{\chi} \tau^{\beta\alpha} +$	
	$4\ ^{ec{l}}\ k^{\chi}\ \partial_{\epsilon}\partial_{\chi}\partial^{eta}\partial^{lpha}G^{\delta\epsilon}\ _{\delta}$ -	
	$6 i k^{\chi} \partial_{\epsilon} \partial_{\delta} \partial_{\chi} \partial^{\alpha} \sigma^{\beta \delta \epsilon}$ -	
	$6 i k^{\chi} \partial_{\epsilon} \partial_{\delta} \partial_{\chi} \partial^{\beta} \sigma^{\alpha \delta \epsilon} +$	
	$2 \eta^{\alpha\beta} \partial_{\epsilon} \partial^{\epsilon} \partial_{\delta} \partial_{\chi} \tau^{\chi\delta} +$	
	$6 i k^{\chi} \partial_{\epsilon} \partial^{\epsilon} \partial_{\delta} \partial_{\chi} \sigma^{\alpha \delta \beta} +$	
	$6 i k^{\chi} \partial_{\epsilon} \partial^{\epsilon} \partial_{\delta} \partial_{\chi} \sigma^{\beta \delta \alpha}$ -	
	$2 \eta^{\alpha\beta} \partial_{\epsilon} \partial^{\epsilon} \partial_{\delta} \partial^{\delta} \tau_{\chi}^{\chi}$	
	$4 i \eta^{\alpha\beta} k^{\chi} \partial_{\phi} \partial^{\phi} \partial_{\epsilon} \partial_{\chi} \sigma^{\delta \epsilon}) == 0$	
Total constraints/gauge generators:	ge generators:	16

2 Οθω _{αιβ} ο"ω ΄ ΙΝΙτ, Χ, Ψ, Ζ] αιχ αιγαται	Quadratic (free) action $S == \iiint (f^{\alpha\beta} \ t_{\alpha\beta} + \omega^{\alpha\beta\chi} \ \sigma_{\alpha\beta\chi} + \frac{1}{2} t_1 (2 \ \omega^{\alpha_{\alpha}} \ \omega_{, \theta}^{ \theta} - 4 \ \omega_{ \theta}^{ \theta} \ \partial_{f} f^{\alpha_{l}} + 4 \ \omega_{, \theta}^{ \theta} \ \partial_{f} f^{\alpha_{l}} - 2 \ \partial_{f} f^{\alpha_{l}} \partial_{\theta} f^{\alpha_{l}} + 4 \partial_{f} f^{\alpha_{\alpha}} \partial_{\theta} f^{ \theta} - 2 \partial_{\sigma} f_{ l} \partial_{\theta} f^{\alpha_{l}} + 4 \partial_{f} f^{\alpha_{\alpha}} \partial_{\theta} f^{ \theta} - 2 \partial_{\sigma} f_{ l} \partial_{\theta} f^{\alpha_{l}} + 4 \partial_{f} f^{\alpha_{\alpha}} \partial_{\theta} f^{ \theta} - 2 \partial_{\sigma} f^{ \theta} \partial_{\theta} f^{\alpha_{l}} + 3 \partial_{f} f^{\alpha_{l}} \partial_{\theta} f^{\alpha_{l}} + 3 \partial_{\sigma} f^{\alpha_{l}} \partial_{\theta} f^{\alpha_{l}} \partial_{\theta} f^{\alpha_{l}} + 3 \partial_{\sigma} f^{\alpha_{l}} \partial_{\theta} f$
$2 O_{ heta} \omega_{lpha eta} = 0$ ישל שיא שו $2 U_{lpha} \omega_{lpha eta} = 0$ ים איז שיא שי	$8\partial_{\beta}\omega_{\iota\theta\alpha}\partial^{\theta}\omega^{\alpha\beta\iota} + 2\partial_{\iota}\omega_{\alpha\beta\theta}\partial^{\theta}\omega^{\alpha\beta\iota} - 2\partial_{\theta}\omega_{\alpha\beta\iota}\partial^{\theta}\omega^{\alpha\beta\iota} - \\ 2\partial_{\theta}\omega_{\alpha\iota\beta}\partial^{\theta}\omega^{\alpha\beta\iota}))[t,x,y,z]dzdydxdt$
$8\partial_\beta\omega_{_{l}\theta\alpha}\partial^\theta\omega^{\alpha\beta_l} + 2\partial_i\omega_{_{\alpha\beta\theta}}\partial^\theta\omega^{\alpha\beta_l} - 2\partial_\theta\omega_{_{\alpha\beta_l}}\partial^\theta\omega^{\alpha\beta_l} -$	$\partial_{\theta}\omega_{_{I}}^{}$ $+4\partial_{eta}\omega_{_{\alpha I}}$ $+2\partial_{eta}\omega_{_{\alpha I}$
$\partial_{\theta}\omega_{I}^{\theta} + 4\partial_{\beta}\omega_{\alpha I\theta}\partial^{\theta}\omega^{\alpha \beta I} - 2\partial_{\beta}\omega_{\alpha \theta I}\partial^{\theta}\omega^{\alpha \beta I} +$ $8\partial_{\beta}\omega_{I\theta\alpha}\partial^{\theta}\omega^{\alpha \beta I} + 2\partial_{I}\omega_{\alpha \beta \theta}\partial^{\theta}\omega^{\alpha \beta I} - 2\partial_{\theta}\omega_{\alpha \beta I}\partial^{\theta}\omega^{\alpha \beta I} -$	$6\partial'\omega^{\alpha\beta}_{\beta}\partial_{\theta}\omega^{}_{\prime} + 3\partial_{\alpha}\omega^{\alpha\beta\prime}\partial_{\theta}\omega^{}_{\prime} - 6\partial'\omega^{\alpha\beta}_{\beta$
$6 \partial' \omega^{\alpha \beta}_{\alpha} \partial_{\theta} \omega_{\beta}^{\ \theta}_{\ \beta}_{\ \beta}_{\ \beta}_{\alpha} + 3 \partial_{\alpha} \omega^{\alpha \beta i} \partial_{\theta} \omega_{\beta}^{\ \theta}_{\ \beta}_{\ \beta}_{\ \beta}_{\ \theta}_{\ \alpha}_{\beta}_{\beta}_{\beta}_{\beta}_{\alpha}_{\beta}_{\beta}_{\beta}_{\beta}_{\beta}_{\beta}_{\beta}_{\beta}_{\beta}_{\beta$	$rac{1}{3}r_1$ (3 $\partial_eta \omega_{,$
$\frac{1}{3}r_{1}(3\partial_{\beta}\omega_{\beta}^{\theta}\partial'\omega^{\alpha\beta}_{\alpha}-3\partial_{\beta}\omega_{\beta}^{\theta}\partial'\omega^{\alpha\beta}_{\alpha}-3\partial_{\alpha}\omega^{\alpha\beta}_{\beta}\partial_{\theta}\omega_{\beta}^{\theta},+$ $6\partial'\omega^{\alpha\beta}_{\alpha}\partial_{\theta}\omega_{\beta}^{\theta},+3\partial_{\alpha}\omega^{\alpha\beta},\partial_{\theta}\omega_{\beta}^{\theta}-6\partial'\omega^{\alpha\beta}_{\alpha}$ $\partial_{\theta}\omega_{\beta}^{\theta}+4\partial_{\beta}\omega_{\alpha\beta}\partial^{\theta}\omega^{\alpha\beta}_{\beta}-2\partial_{\beta}\omega_{\alpha\beta}\partial^{\theta}\omega^{\alpha\beta}_{\beta}+$ $8\partial_{\beta}\omega_{\beta}\partial^{\theta}\omega^{\alpha\beta}_{\beta}+2\partial_{\beta}\omega_{\alpha\beta}\partial^{\theta}\omega^{\alpha\beta}_{\beta}-2\partial_{\theta}\omega_{\alpha\beta}\partial^{\theta}\omega^{\alpha\beta}_{\beta}-$	$\partial_{\theta} f_{,\alpha} \partial^{\theta} f^{\alpha\prime} + 2 \ \omega_{\alpha\theta\prime} \ (\omega^{\alpha\prime\theta} + 2 \ \partial^{\theta} f^{\alpha\prime}))$ -
$\partial_{\theta} f_{1\alpha} \partial^{\theta} f^{\alpha l} + 2 \omega_{\alpha \theta_{l}} (\omega^{\alpha l \theta} + 2 \partial^{\theta} f^{\alpha l})) -$ $\frac{1}{3} r_{1} (3 \partial_{\beta} \omega_{l}^{\theta} \partial^{l} \omega^{\alpha \beta}_{\alpha} - 3 \partial_{l} \omega_{l}^{\theta} \partial^{l} \omega^{\alpha \beta}_{\alpha} - 3 \partial_{\alpha} \omega^{\alpha \beta_{l}} \partial_{\theta} \omega_{l}^{\theta} +$ $6 \partial^{l} \omega^{\alpha \beta}_{\alpha} \partial_{\theta} \omega_{l}^{\theta} + 3 \partial_{\alpha} \omega^{\alpha \beta_{l}} \partial_{\theta} \omega_{l}^{\theta} - 6 \partial^{l} \omega^{\alpha \beta}_{\alpha}$ $\partial_{\theta} \omega_{l}^{\theta} + 4 \partial_{\beta} \omega_{\alpha l \theta} \partial^{\theta} \omega^{\alpha \beta_{l}} - 2 \partial_{\beta} \omega_{\alpha \beta_{l}} \partial^{\theta} \omega^{\alpha \beta_{l}} +$ $8 \partial_{\beta} \omega_{l \theta \alpha}^{l} \partial^{\theta} \omega^{\alpha \beta_{l}} + 2 \partial_{l} \omega_{\alpha \beta \theta}^{l} \partial^{\theta} \omega^{\alpha \beta_{l}} - 2 \partial_{\theta} \omega_{\alpha \beta_{l}}^{l} -$ $8 \partial_{\beta} \omega_{l \theta \alpha}^{l} \partial^{\theta} \omega^{\alpha \beta_{l}} + 2 \partial_{l} \omega_{\alpha \beta_{l}}^{l} - 2 \partial_{\beta} \omega^{\alpha \beta_{l}} - 2 \partial_{\theta} \omega^{\alpha \beta_{l}} -$	$\partial^{\theta}f^{\alpha\prime} - \partial_{\alpha}f_{\theta\prime} \partial^{\theta}f^{\alpha\prime} + \partial_{\prime}f_{\alpha\theta} \partial^{\theta}f^{\alpha\prime} + \partial_{\theta}f_{\alpha\prime} \partial^{\theta}f^{\alpha\prime} +$
$\partial^{\theta} f^{\alpha l} - \partial_{\alpha} f_{\theta_{l}} \partial^{\theta} f^{\alpha l} + \partial_{l} f_{\alpha \theta} \partial^{\theta} f^{\alpha l} + \partial_{\theta} f_{\alpha l} \partial^{\theta} f^{\alpha l} +$ $\partial_{\theta} f_{l\alpha} \partial^{\theta} f^{\alpha l} + 2 \omega_{\alpha \theta_{l}} (\omega^{\alpha l\theta} + 2 \partial^{\theta} f^{\alpha l}) -$ $\frac{1}{3} r_{1} (3 \partial_{\beta} \omega_{l}^{\theta} \partial^{l} \omega^{\alpha \beta} - 3 \partial_{l} \omega_{l}^{\theta} \partial^{l} \omega^{\alpha \beta} - 3 \partial_{\alpha} \omega^{\alpha \beta l} \partial_{\theta} \omega_{l}^{\theta} +$ $6 \partial^{l} \omega^{\alpha \beta} \partial^{\theta} \omega^{\beta} + 3 \partial_{\alpha} \omega^{\alpha \beta l} \partial^{\theta} \omega^{\beta} - 6 \partial^{l} \omega^{\alpha \beta} -$ $\partial_{\theta} \omega_{l}^{\theta} + 4 \partial_{\beta} \omega_{\alpha l\theta} \partial^{\theta} \omega^{\alpha \beta l} - 2 \partial_{\beta} \omega_{\alpha \theta_{l}} \partial^{\theta} \omega^{\alpha \beta l} +$ $8 \partial_{\beta} \omega_{l\theta \alpha} \partial^{\theta} \omega^{\alpha \beta l} + 2 \partial_{l} \omega_{\alpha \beta \theta} \partial^{\theta} \omega^{\alpha \beta l} - 2 \partial_{\theta} \omega_{\alpha \beta l} - 2 \partial_{\theta} \omega_{\alpha \beta l} -$ $\partial_{\theta} \omega_{l}^{\theta} \partial^{\theta} \omega^{\alpha \beta l} + 2 \partial_{l} \omega_{\alpha \beta \theta} \partial^{\theta} \omega^{\alpha \beta l} - 2 \partial_{\theta} \omega_{\alpha \beta l} -$ $\partial_{\theta} \omega_{l}^{\theta} \partial^{\theta} \omega^{\alpha \beta l} + 2 \partial_{l} \omega_{\alpha \beta \theta} \partial^{\theta} \omega^{\alpha \beta l} - 2 \partial_{\theta} \omega_{\alpha \beta l} -$ $\partial_{\theta} \omega_{l}^{\theta} \partial^{\theta} \omega^{\alpha \beta l} + 2 \partial_{l} \omega_{\alpha \beta \theta} \partial^{\theta} \omega^{\alpha \beta l} - 2 \partial_{\theta} \omega_{\alpha \beta l} -$	$2 \partial_i f^{\theta}_{\ \ \theta} \partial^i f^{\alpha}_{\ \ \alpha} - 2 \partial_i f^{\alpha i} \partial_{\theta} f_{\ \alpha}^{\ \ \theta} + 4 \partial^i f^{\alpha}_{\ \alpha} \partial_{\theta} f_{\ i}^{\ \theta} - 2 \partial_{\alpha} f_{\ i \theta}$
$2 \partial_{i} f^{\theta}_{\theta} \partial^{i} f^{\alpha}_{\alpha} - 2 \partial_{i} f^{\alpha i} \partial_{\theta} f^{\theta}_{\alpha} + 4 \partial^{i} f^{\alpha}_{\alpha} \partial_{\theta} f^{i}_{\theta} - 2 \partial_{\alpha} f_{i\theta}$ $ \partial^{\theta} f^{\alpha i} - \partial_{\alpha} f_{\theta i} \partial^{\theta} f^{\alpha i} + \partial_{i} f_{\alpha \theta} \partial^{\theta} f^{\alpha i} + \partial_{\theta} f_{\alpha i} \partial^{\theta} f^{\alpha i} +$ $ \partial_{\theta} f_{i\alpha} \partial^{\theta} f^{\alpha i} + 2 \omega_{\alpha \theta i} (\omega^{\alpha i \theta} + 2 \partial^{\theta} f^{\alpha i})) -$ $ \frac{1}{3} r_{1} (3 \partial_{\beta} \omega_{i}^{\theta} \partial^{\theta} \partial^{\alpha} \partial^{\beta} \partial^{\alpha} \partial^{\beta} \partial^{\alpha} \partial^{\beta} \partial^{$	$rac{1}{2}t_1$ (2 $\omega^{lpha_\prime}_{}$ $$
$\frac{1}{2}t_{1}(2 \omega^{\alpha_{l}} \omega_{l}^{\theta} - 4 \omega_{\alpha}^{\theta} \partial_{l}f^{\alpha_{l}} + 4 \omega_{l}^{\theta} \partial^{l}f^{\alpha}_{\alpha} - 2 \partial_{l}f^{\alpha_{l}} \partial_{\theta}f^{\alpha_{l}} + 4 \omega_{l}^{\theta} \partial^{l}f^{\alpha}_{\alpha} - 2 \partial_{l}f^{\alpha_{l}} \partial_{\theta}f^{\alpha_{l}} + 4 \partial^{l}f^{\alpha}_{\alpha} \partial_{\theta}f^{\beta}_{l} - 2 \partial_{\alpha}f_{l\theta} + 3 \partial^{l}f^{\alpha_{l}} \partial_{\theta}f^{\alpha_{l}} + 3 \partial^{l}f^{\alpha_{l}} \partial_{\theta}f^{\alpha_{l}} + 3 \partial^{l}f^{\alpha_{l}} \partial^{\theta}f^{\alpha_{l}} + 3 \partial^{l}f^{\alpha_{l}} \partial^{\theta}f^{\alpha_{l}} + 3 \partial^{l}f^{\alpha_{l}} \partial^{\theta}f^{\alpha_{l}} + 2 \partial^{l}f^{\alpha_{l}} \partial^{\theta}f^{\alpha_{l}} \partial^{\theta}f^{\alpha_{l}} \partial^{\theta}f^{\alpha_{l}} + 2 \partial^{l}f^{\alpha_{l}} \partial^{\theta}f^{\alpha_{l}} \partial$	$S == \iiint (f^{\alpha\beta} \ \tau_{\alpha\beta} + \omega^{\alpha\beta\chi} \ \sigma_{\alpha\beta\chi} +$
$S == \iiint (f^{\alpha\beta} \ t_{\alpha\beta} + \omega^{\alpha\beta\chi} + \omega^{\beta} + $	Quadratic (free) action
1 × 7	

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$ au_{1}^{\#2}$	0	0	0	$\frac{2ik}{t_1 + 2k^2t_1}$	$i\sqrt{2}k$ $(1+2k^2)^2t_1$	0	$\frac{2k^2}{(1+2k^2)^2t_1}$	$\sigma_{0}^{\#1}$ -	- (1+	1 -2 k ²) ² i	<u>-</u> (1-	i √2 k +2 k ²) ²	- C	0	
				t ₁₊ ;	(1+2		2 (1+2	$ au_{0}^{\#1}$ -	- 	$\frac{i\sqrt{2}k}{(2k^2)^2}$	- : ₁ (1	$\frac{2k^2}{+2k^2)^2}$	${t_1}$	0)
$\tau_{1}^{\#1}{}_{\alpha}$	0	0	0	0	0	0	0	$\tau_{0}^{\#2}$ -	t	0		0	С	0	'
$\sigma_{1}^{\#2}{}_{lpha}$	0	0	0	$\frac{\sqrt{2}}{t_1 + 2k^2t_1}$	$\frac{1}{(1+2k^2)^2t_1}$	0	$\frac{i\sqrt{2}k}{(1+2k^2)^2t_1}$		†	0		0	C	$-\frac{1}{t}$	σ
				ts			1	$f_{1}^{\#2}$	0	0	0	$i k t_1$	0	0	0
$\sigma_{1^{ ext{-}}lpha}^{\#1}$	0	0	0	0	$\frac{\sqrt{2}}{t_1 + 2k^2t_1}$	0	$\frac{2ik}{t_1 + 2k^2t_1}$	$f_{1^-}^{\#1} \alpha$	0	0	0	0	0	0	0
		$\frac{(1)}{2}$	$\frac{t_1}{2}$		7		ı	$\omega_{1^{-}}^{\#2}{}_{lpha}$	0	0	0	$\frac{t_1}{\sqrt{2}}$	0	0	0
$\tau_{1}^{\#1}{}_{\alpha\beta}$	$-\frac{i\sqrt{2}k}{t_1+k^2t_1}$	$\frac{i(2k^3r_1-kt_1)}{(1+k^2)^2t_1^2}$	$\frac{-2k^4r_1+k^2t_1}{(1+k^2)^2t_1^2}$	0	0	0	0	$\omega_{1}^{\#1}{}_{\alpha}$	0	0	0	$-\frac{t_1}{2}$	$\frac{t_1}{\sqrt{2}}$	0	$-\vec{l} k t_1$
$ \beta $	t ₁	I						$f_{1}^{\#1}$	$-\frac{ikt_1}{\sqrt{2}}$	0	0	0	0	0	0
$\sigma_{1}^{\#2}{}_{lphaeta}$	$-\frac{\sqrt{2}}{t_1+k^2t_1}$	$\frac{-2k^2r_1+t_1}{(1+k^2)^2t_1^2}$	$\frac{i(2k^3r_1-kt_1)}{(1+k^2)^2t_1^2}$	0	0	0	0	$\omega_{1}^{\#2}_{\alpha\beta}\;f_{1}^{\#1}_{\alpha\beta}$	$-\frac{t_1}{\sqrt{2}}$	0	0	0	0	0	0
$\sigma_{1}^{\#1}{}_{\alpha\beta}$	0	$-\frac{\sqrt{2}}{t_1+k^2t_1}$	$\frac{i\sqrt{2}k}{t_1+k^2t_1}$	0	0	0	0	$\omega_{1}^{\#1}{}_{\alpha\beta}$	$k^2 r_1 - \frac{t_1}{2}$	$-\frac{t_1}{\sqrt{2}}$	$\frac{ikt_1}{\sqrt{2}}$	0	0	0	0
	$\sigma_{1}^{\#1} + \alpha^{\beta}$	$\sigma_1^{\#2} + \alpha \beta$	$\tau_1^{\#1} + \alpha \beta$	$\sigma_{1}^{\#1} \dagger^{lpha}$	$\sigma_{1}^{\#2} +^{\alpha}$	$\tau_{1}^{\#1} +^{\alpha}$	$\tau_{1}^{\#2} +^{\alpha}$		$\omega_{1}^{\#1} + \alpha \beta$	$\omega_1^{\#_2} + \alpha \beta$	$f_{1}^{\#1} + \alpha \beta$	$\omega_{1^{\tilde{-}1}}^{\#_1} +^{\alpha}$	$\omega_1^{\#2} +^{lpha}$	$f_{1}^{#1} \dagger^{\alpha}$	$f_{1}^{#2} +^{\alpha}$
	О	D	1						3	3	<i>F</i> .	3	3		

_								
ω_{0}^{-1}	0	0	0	<i>-t</i> ₁				
₊ 0 /	0	0	0	0				
/ ⁰ +	$i\sqrt{2}\ kt_1$	$-2 k^2 t_1$	0	0		$\omega_{2^{+}lphaeta}^{\sharp 1}$	$f_{2^+ \alpha \beta}^{\# 1}$	$\omega_{2}^{\#1}{}_{lphaeta_{1}}$
ω_0^+	$-t_1$	$\overline{2} kt_1$	0	0	$\omega_{2}^{\#1}\dagger^{lphaeta}$	<u>t</u> 1 2	$-\frac{ikt_1}{\sqrt{2}}$	0
3		. -ij-			$f_{2+}^{#1}\dagger^{\alpha\beta}$	$\frac{i k t_1}{\sqrt{2}}$	$k^2 t_1$	0
	$\omega_{0}^{\#1}$ \dagger	$f_{0}^{\#1}$ †	$f_{0}^{#2}$ †	$\omega_{0}^{\#1}$ \dagger	$\omega_2^{\#1} \dagger^{lphaeta\chi}$	0	0	$k^2 r_1 + \frac{1}{2}$
					-			

 $au_2^{\#1}{}_{lphaeta}$

 $-\frac{2i\sqrt{2}k}{(1+2k^2)^2t_1}$

 $\frac{4k^2}{(1+2k^2)^2t_1}$

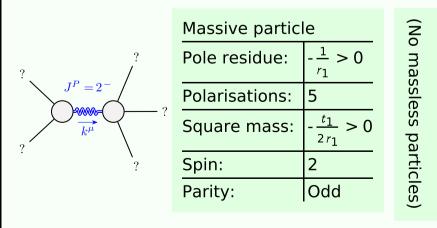
 $\frac{2i\sqrt{2}k}{(1+2k^2)^2t_1}$

 $\sigma_{2^{-}\alpha\beta\chi}^{\#1}$

 $\frac{2}{2k^2r_1+t_1}$

 $\tau_{0}^{\#2}$ $\sigma_{0}^{\#1}$

Massive and massless spectra



Unitarity conditions

 $r_1 < 0 \&\& t_1 > 0$