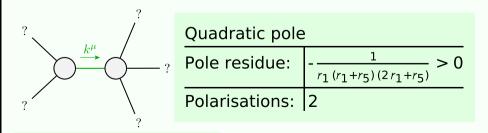
Particle spectrograph

Wave operator and propagator

Source constraints	raints	
50(3) irreps	5O(3) irreps Fundamental fields	Multiplicities
$\sigma_{0}^{\#1} == 0$	$\epsilon \eta_{\alpha\beta\chi\delta} \partial^{\delta} \sigma^{\alpha\beta\chi} == 0$	1
$\sigma_{0}^{\#1} = 0$	$\partial_{\beta}\sigma^{\alpha\beta}_{\alpha} == 0$	1
$\sigma_{1}^{\#2}\alpha == 0$	$\partial_{\chi}\partial_{\beta}\sigma^{\alpha\beta\chi} == 0$	е
$\sigma_1^{\#2}\alpha\beta == 0$	$\partial_{\delta}\partial_{\chi}\partial^{\alpha}\sigma^{\beta\chi\delta} + \partial_{\delta}\partial^{\delta}\partial_{\chi}\sigma^{\alpha\beta\chi} = \partial_{\delta}\partial_{\chi}\partial^{\beta}\sigma^{\alpha\chi\delta}$	8
$\sigma_2^{\#1}\alpha\beta == 0$	$3 \partial_{\delta} \partial_{\chi} \partial^{\alpha} \sigma^{\beta \chi \delta} + 3 \partial_{\delta} \partial_{\chi} \partial^{\beta} \sigma^{\alpha \chi \delta} + 2 \eta^{\alpha \beta} \partial_{\epsilon} \partial^{\epsilon} \partial_{\delta} \sigma^{\chi \delta}_{\chi} = =$	5
	$2 \partial_{\delta} \partial^{\beta} \partial^{\alpha} \sigma^{\chi \delta}_{\chi} + 3 (\partial_{\delta} \partial^{\delta} \partial_{\chi} \sigma^{\alpha \chi \beta} + \partial_{\delta} \partial^{\delta} \partial_{\chi} \sigma^{\beta \chi \alpha})$	
otal constra	Fotal constraints/gauge generators:	13
Quadratic (free) action	ee) action	
$S == \iiint (\mathcal{A}^{\alpha_j})$	$S == \iiint (\mathcal{A}^{\alpha\beta\chi} \ \sigma_{\alpha\beta\chi} - \frac{2}{3} \ r_1 \ (2 \ \partial_{\beta}\mathcal{A}_{\alpha\prime\theta} - \partial_{\beta}\mathcal{A}_{\alpha\theta\prime} + 4 \ \partial_{\beta}\mathcal{A}_{\beta\alpha} +$	
	$\partial_{artheta}\mathcal{A}_{lphaeta heta}$ - $\partial_{ heta}\mathcal{A}_{lphaeta_{artheta}}$ - $\partial_{ heta}\mathcal{A}_{lpha_{artheta_{artheta}}}$ $\partial^{ heta}\mathcal{A}^{lphaeta_{artheta'}}$ +	
	$r_{5}\left(\partial_{i}\mathcal{A}_{\theta}^{k}\partial^{\theta}\mathcal{A}^{lpha_{i}}_{lpha}\!-\!\partial_{\theta}\mathcal{A}_{i}^{k}\partial^{\theta}\mathcal{A}^{lpha_{i}}_{}\!-\!(\partial_{lpha}\mathcal{A}^{lpha_{i} heta}\!-\!2\partial^{\theta}\mathcal{A}^{lpha_{i}}_{lpha})$	$^{ heta}\mathcal{A}^{lpha_{l}})$
	$(\partial_{\kappa}\mathcal{A}_{,\;\; heta}^{\;\; \kappa}-\partial_{\kappa}\mathcal{A}_{\theta_{\;\; }^{\;\; \kappa}})))[t,\; \kappa,\; y,\; z] dz dy dx dt$	dt
$egin{array}{c} \mathcal{A}_1^{\#} \ \mathcal{A}_1^{\#} \ \end{array}$	$\sigma_{1}^{\#1}$ $\sigma_{1}^{\#2}$ $\sigma_{1}^{\#2}$ $\sigma_{1}^{\#3}$	${\mathcal A}_{2^+lphaeta}^{*1}\;{\mathcal A}_{2^-lphaeta}^{*1}$

_			_							
$\alpha \beta \chi$		$k^2 r_1$ $a \beta \chi$							$\sigma_{0}^{\#1}$ $\sigma_{0}^{\#1}$	
\mathcal{A}_2^*		κ ₂	$\sigma_{2}^{\#1}$	0	-	$\frac{1}{k^2 r_1}$	$\sigma_{0}^{\#1}$		0	
${\mathscr A}_2^{\#1}_{+lphaeta}{\mathscr A}_2^{\#1}_{-}$	0	0	$\sigma_{2}^{\#1}$	0		0	$\sigma_0^{\#1}$		0	
a)	$+^{\alpha\beta}$	$\chi_{\rm S}$	σ_2^*	<u>~</u>				${\cal A}_0^{\#}$	$\mathcal{A}^{1}_{+} \mathcal{A}^{\# 1}_{0}$	
		$1 + \alpha \beta \chi$		$\frac{1}{4} + \alpha \beta$, 6	$+_{nb\chi}$	$\mathcal{R}_{0}^{\sharp 1}$		0	
	$\mathcal{A}_2^{\#1}$	$\mathcal{A}_{2}^{\#1}$ \dagger		$\sigma^{\#1}_{2+}$	7	σ_{2}^{*1}	$\mathcal{A}_0^{\#1}$	† 0	0	
$\sigma_{1^{+}lphaeta}^{\sharp1}$ $\sigma_{1^{+}lphaeta}^{\sharp2}$ $\sigma_{1^{-}lpha}^{\sharp1}$ $\sigma_{1^{-}lpha}^{\sharp2}$										
$\sigma_{1}^{\#1} \dagger^{\alpha\beta}$		$\frac{1}{k^2\left(2r_1+r_5\right)}$		0		0		0		
$\sigma_{1}^{\#2}\dagger^{lphaeta}$		C	0		0		0	0		
$\sigma_1^{\!\scriptscriptstyle \# 1}\dagger^lpha$		0		0		$\frac{1}{k^2\left(r_1+r_5\right)}$		0		
$\sigma_1^{\#2} \dagger^{\alpha}$		C	0		0		0	0		
$\mathcal{A}_{1}^{\sharp 1}{}_{lphaeta}$ $\mathcal{A}_{1}^{\sharp 2}{}_{lphaeta}$ $\mathcal{A}_{1}^{\sharp 1}{}_{lpha}$ $\mathcal{A}_{1}^{\sharp 2}{}_{lpha}$										
$\mathcal{A}_1^{\#}$	¹ † ^{αβ}	k^2 (2	$k^2 (2r_1 + r_1)$			0	0		0	
$\mathcal{A}_1^{\#_2}$	² † ^{αβ}		0		0		0		0	
\mathcal{A}_{i}	$_{1}^{\#1}$ † $^{\alpha}$		0			0	$k^2\left(r_1+r_5\right)$		0	
\mathcal{A}^{\dagger}	$_{1}^{\#2}\dagger^{\alpha}$ 0				0		0		0	

Massive and massless spectra



(No massive particles)

Unitarity conditions

$$r_1 < 0 \&\& (r_5 < -r_1 || r_5 > -2 r_1) || r_1 > 0 \&\& -2 r_1 < r_5 < -r_1$$