Particle spectrograph

Wave operator and propagator

e) Lagrangian density	$\omega^{\alpha\beta\chi} \ \sigma_{\alpha\beta\chi} - \tfrac{1}{2} r_3 \partial_i \omega^{\kappa\lambda}_{\kappa} \partial^i \omega_{\alpha}^{\alpha} - r_5 \partial_i \omega^{\kappa\lambda}_{\kappa} \partial^i \omega_{\alpha}^{\alpha} + \tfrac{1}{2} r_3 \partial_\alpha \omega_{\alpha}^{\alpha} \partial_\kappa \omega^{\theta\kappa\lambda}_{\alpha} -$	$r_5\partial_{lpha}\omega_{\lambda}^{lpha}\partial_{\kappa}\omega^{ heta\kappa\lambda}-rac{1}{2}r_3\partial_{ heta}\omega_{\lambda}^{lpha}\partial_{\kappa}\omega^{ heta\kappa\lambda}+r_5\partial_{ heta}\omega_{\lambda}^{lpha}\partial_{\kappa}\omega^{ heta\kappa\lambda}-rac{1}{2}r_3\partial_{lpha}\omega_{\lambda}^{lpha}\partial_{\kappa}\omega^{\kappa\lambda heta}-rac{1}{2}r_3\partial_{lpha}\omega_{\lambda}^{lpha}\partial_{\kappa}\omega^{\kappa\lambda heta}$	$r_5\partial_{lpha}\omega_{\lambda}^{lpha}\partial_{\kappa}\omega^{\kappa\lambda\theta}+r_3\partial_{\theta}\omega_{\lambda}^{lpha}\partial_{\kappa}\omega^{\kappa\lambda\theta}+2r_5\partial_{\theta}\omega_{\lambda}^{lpha}\partial_{\kappa}\omega^{\kappa\lambda\theta}-4r_3\partial^{eta}\omega_{\lambda}^{\lambdalpha}\partial_{\lambda}\omega_{lphaeta}^{\prime}-$	$\frac{1}{2} r_3 \partial_\alpha \omega_\lambda^{\ \alpha}_{\ \ \beta} \partial^\lambda \omega^{\theta \kappa}_{\ \ \kappa} + r_5 \partial_\alpha \omega_\lambda^{\ \alpha}_{\ \ \beta} \partial^\lambda \omega^{\theta \kappa}_{\ \ \kappa} + \frac{1}{2} r_3 \partial_\theta \omega_\lambda^{\ \alpha}_{\ \ \alpha} \partial^\lambda \omega^{\theta \kappa}_{\ \ \kappa} - r_5 \partial_\theta \omega_\lambda^{\ \alpha}_{\ \ \alpha} \partial^\lambda \omega^{\theta \kappa}_{\ \ \kappa}$
Quadratic (free) Lagrangian density	$\omega^{lphaeta\chi}~\sigma_{lphaeta\chi}^{-rac{1}{2}}r_3\partial_i\omega^{\kappa\lambda}_{\kappa}\partial^i\omega_{\lambda}^{\alpha}$	$^{r_5}\partial_{lpha}\omega_{\lambda}^{\alpha}_{}\partial_{\kappa}\omega^{ heta\kappa\lambda}_{}$ - $rac{1}{2}$ $^{r_3}\partial_{ heta}\omega_{\lambda}^{lpha}$	$r_5 \partial_{lpha} \omega_{\lambda}^{ lpha} \partial_{\kappa} \omega^{\kappa \lambda heta} + r_3 \partial_{ heta} \omega_{\lambda}^{ lpha} \dot{\zeta}$	$rac{1}{2}r_3\partial_{lpha}\omega_{\lambda}^{lpha}\partial^{\lambda}\omega^{ heta\kappa}_{}+r_5\partial_{lpha}\omega_{\lambda}^{lpha}$

	$\omega_{1^{+}lphaeta}^{\sharp1}$	$\omega_{1^{+}\alpha\beta}^{\#2}$	$\omega_{1}^{\sharp 1}{}_{lpha}$	$\omega_{1}^{\#2}{}_{\alpha}$
$\omega_{1}^{\#1} \dagger^{\alpha\beta}$	$k^2 (2 r_3 + r_5)$	0	0	0
$\omega_{1}^{\#2} \dagger^{\alpha\beta}$	0	0	0	0
$\omega_1^{\#1} \dagger^{lpha}$	0	0	$\frac{1}{2} k^2 (r_3 + 2 r_5)$	0
$\omega_1^{\#2} \uparrow^{\alpha}$	0	0	0	0

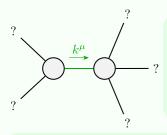
				-	0,+	$\sigma_0^{\pi_1}$
$\sigma_{2^{ ext{-}}}^{\#1} lpha_{eta \chi}$)	0		$\sigma_{0^+}^{\#1}\dagger$	0	0
				$\sigma_{0}^{\#1}$ †	0	0
$\sigma_{2}^{\#1}$	$\frac{2}{2^{r_3}}$					
$\sigma_{2}^{\#1}$	$-\frac{2}{3k^2r_3}$	0			$\omega_{0^+}^{\#1}$	$\omega_0^{\#1}$
	$+\alpha\beta$	$+^{\alpha eta \chi}$		$\omega_{0}^{\sharp 1}$ †	0	0
	$\sigma_{2}^{\#1}$	$\sigma_{2}^{\#1}$		$\omega_0^{\#1}$ †	0	0
$\omega_{2^{+}\alpha\beta}^{\sharp1}$ $\omega_{2^{-}\alpha\beta\chi}^{\sharp1}$						

0

ource constraint	ource constraints/gauge generators
0(3) irreps	Multiplicities
$r_{0}^{\#1} == 0$	1
$r_{0+}^{\#1} == 0$	1
	3
$J_1^{\#2}\alpha\beta == 0$	3
$\tau_{2^{-}}^{\#1}\alpha\beta\chi == 0$	5
otal constraints: 13	13

	$\sigma_{1^{+}lphaeta}^{\sharp1}$	$\sigma_{1^{+}\alpha\beta}^{\#2}$	$\sigma_{1}^{\#1}{}_{lpha}$	$\sigma_{1}^{\#2}{}_{\alpha}$
$\sigma_{1}^{\#1}\dagger^{lphaeta}$	$\frac{1}{k^2(2r_3+r_5)}$	0	0	0
$\sigma_{1}^{\#2} \dagger^{\alpha\beta}$	0	0	0	0
$\sigma_{1}^{\sharp_{1}}$ † lpha	0	0	$\frac{2}{k^2(r_3+2r_5)}$	0
$\sigma_1^{\#2} \dagger^{\alpha}$	0	0	0	0

Massive and massless spectra



Quadratic pole				
Pole residue:	$-\frac{1}{r_3(2r_3+r_5)(r_3+2r_5)} > 0$			
Polarisations:	2			

(No massive particles)

Unitarity conditions

$$r_3 < 0 \&\& (r_5 < -\frac{r_3}{2} || r_5 > -2 r_3) || r_3 > 0 \&\& -2 r_3 < r_5 < -\frac{r_3}{2}$$