Particle spectrograph

Wave operator and propagator

	$\omega^{\#1}_{2^+\,\alpha\beta}$	$f^{\#1}_{2^+\,\alpha\beta}$	$\omega^{\#1}_{2^-\,\alpha\beta\chi}$
$\omega^{\#1}_{2^+}\dagger^{\alpha\beta}$	0	0	0
$f^{\#1}_{2^+}\dagger^{\alpha\beta}$	0	$2\,\beta_1\,k^2$	0
$\omega^{\#1}_{2^-}\dagger^{\alpha\beta\chi}$	0	0	0

Source constraints/gauge generators

SO(3) irreps	Multiplicities
$\tau^{\#2}_{0^+} == 0$	1
$\sigma^{\#1}_{0^+} == 0$	1
$\tau^{\#2\,\alpha}_{1^-} == 0$	3
$\tau^{\#1\,\alpha}_{1^-} == 0$	3
$\sigma^{\#2\,\alpha}_{1^-} == 0$	3
$\sigma^{\#1\,\alpha}_{1^-} == 0$	3
$\tau^{\#1\,\alpha\beta}_{1^+} == 0$	3
$\sigma^{\#2\,\alpha\beta}_{1^+} == 0$	3
$\sigma^{\#1\,\alpha\beta}_{1^+} == 0$	3
$\sigma^{\#1\,\alpha\beta}_{2^+} == 0$	5
$\sigma^{\#1\,\alpha\beta\chi}_{2^-} == 0$	5
Total constraints:	33

Quadratic (free) action

$$S == \iiint\Big(f^{\alpha\beta}{}_{\alpha\beta}\,\tau_{\alpha\beta}+\omega^{\alpha\beta\chi}\,\sigma_{\alpha\beta\chi}+\beta_1\,(-4\,\omega^{\chi}{}_{\alpha\chi}\,\partial_\beta f^{\alpha\beta}+4\,\partial_\beta\omega^{\alpha\beta}{}_{\alpha}+4\,\omega^{\chi}{}_{\beta\chi}\,\partial^\beta f^{\alpha}{}_{\alpha}-2\,\partial_\beta f^{\chi}{}_{\chi}\,\partial^\beta f^{\alpha}{}_{\alpha}+4\,\partial^\beta f^{\alpha}{}_{\alpha}\,\partial_\chi f^{\chi}{}_{\beta}-4\,f^{\alpha\beta}\,(\partial_\beta\omega^{\chi}{}_{\alpha\chi}-\partial_\chi\omega^{\chi}{}_{\alpha\beta})-4\,f^{\alpha}{}_{\alpha}\,\partial_\chi\omega^{\beta\chi}{}_{\beta}+4\,\omega_{\alpha\chi\beta}\,\partial^\chi f^{\alpha\beta}-2\,\partial_\alpha f^{\alpha\beta}\,\partial^\chi f^{\alpha\beta}-2\,\partial_\alpha f_{\beta\chi}\,\partial^\chi f^{\alpha\beta}-\partial_\alpha f_{\chi\beta}\,\partial^\chi f^{\alpha\beta}+\partial_\beta f_{\alpha\chi}\,\partial^\chi f^{\alpha\beta}+\partial_\chi f_{\beta\alpha}\,\partial^\chi f^{\alpha\beta})+\tfrac{1}{3}\,\alpha_3\,(4\,\partial_\beta\omega_{\alpha\chi\delta}\,\partial^\delta\omega^{\alpha\beta\chi}-2\,\partial_\beta\omega_{\alpha\delta\chi}\,\partial^\delta\omega^{\alpha\beta\chi}-2\,\partial_\beta\omega_{\chi\delta\alpha}\,\partial^\delta\omega^{\alpha\beta\chi}-2\,\partial_\delta\omega_{\alpha\chi\beta}\,\partial^\delta\omega^{\alpha\beta\chi})\Big][t,\,x,\,y,\,z]\,dz\,dy\,dx\,dt$$

	$\sigma^{\#1}_{2^+\,\alpha\beta}$	$\tau^{\#1}_{2^+\,\alpha\beta}$	$\sigma^{\#1}_{2^-\,\alpha\beta\chi}$
$\sigma^{\#1}_{2^+}\dagger^{\alpha\beta}$	0	0	0
$\tau^{\#1}_{2^+}\dagger^{\alpha\beta}$	0	$\frac{1}{2\,\beta_1\,k^2}$	0
$\sigma^{\#1}_{2^-}\dagger^{\alpha\beta\chi}$	0	0	0

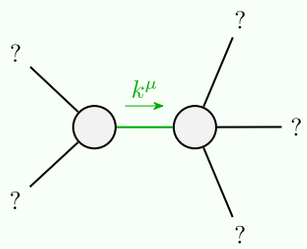
	$\sigma^{\#1}_{0^+}\dagger$	$\tau^{\#1}_{0^+}\dagger$	$\tau^{\#2}_{0^+}\dagger$	$\sigma^{\#1}_{0^-}\dagger$
$\sigma^{\#1}_{0^+}$	0	0	0	$\frac{1}{\alpha_3\,k^2}$
$\tau^{\#1}_{0^+}$	0	$-\frac{1}{4\,\beta_1\,k^2}$	0	0
$\tau^{\#2}_{0^+}$	0	0	0	0
$\sigma^{\#1}_{0^-}$	0	0	0	0

	$\omega^{\#1}_{0^+}\dagger$	$f^{\#1}_{0^+}\dagger$	$f^{\#2}_{0^+}\dagger$	$\omega^{\#1}_{0^-}\dagger$
$\omega^{\#1}_{0^+}$	0	0	0	$\alpha_3\,k^2$
$f^{\#1}_{0^+}$	0	$-4\,\beta_1\,k^2$	0	0
$f^{\#2}_{0^+}$	0	0	0	0
$\omega^{\#1}_{0^-}$	0	0	0	0

	$\omega^{\#1}_{1^+\,\alpha\beta}$	$\omega^{\#2}_{1^+\,\alpha\beta}$	$f^{\#1}_{1^+\,\alpha\beta}$	$\omega^{\#1}_{1^-\,\alpha}$	$\omega^{\#2}_{1^-\,\alpha}$	$f^{\#1}_{1^-\,\alpha}$	$f^{\#2}_{1^-\,\alpha}$
$\omega^{\#1}_{1^+}\dagger^{\alpha\beta}$	0	0	0	0	0	0	0
$\omega^{\#2}_{1^+}\dagger^{\alpha\beta}$	0	0	0	0	0	0	0
$f^{\#1}_{1^+}\dagger^{\alpha\beta}$	0	0	0	0	0	0	0
$\omega^{\#1}_{1^-}\dagger^{\alpha}$	0	0	0	0	0	0	0
$\omega^{\#2}_{1^-}\dagger^{\alpha}$	0	0	0	0	0	0	0
$f^{\#1}_{1^-}\dagger^{\alpha}$	0	0	0	0	0	0	0
$f^{\#2}_{1^-}\dagger^{\alpha}$	0	0	0	0	0	0	0

	$\sigma^{\#1}_{1^+\,\alpha\beta}$	$\sigma^{\#2}_{1^+\,\alpha\beta}$	$\tau^{\#1}_{1^+\,\alpha\beta}$	$\sigma^{\#1}_{1^-\,\alpha}$	$\sigma^{\#2}_{1^-\,\alpha}$	$\tau^{\#1}_{1^-\,\alpha}$	$\tau^{\#2}_{1^-\,\alpha}$
$\sigma^{\#1}_{1^+}\dagger^{\alpha\beta}$	0	0	0	0	0	0	0
$\sigma^{\#2}_{1^+}\dagger^{\alpha\beta}$	0	0	0	0	0	0	0
$\tau^{\#1}_{1^+}\dagger^{\alpha\beta}$	0	0	0	0	0	0	0
$\sigma^{\#1}_{1^-}\dagger^{\alpha}$	0	0	0	0	0	0	0
$\sigma^{\#2}_{1^-}\dagger^{\alpha}$	0	0	0	0	0	0	0
$\tau^{\#1}_{1^-}\dagger^{\alpha}$	0	0	0	0	0	0	0
$\tau^{\#2}_{1^-}\dagger^{\alpha}$	0	0	0	0	0	0	0

Massive and massless spectra



Quadratic pole

Pole residue:	$\frac{1}{\beta_1} > 0$
Polarisations:	2

(No massive particles)

Unitarity conditions

$\beta_1 > 0$