

Wave operator and propagator

$\sigma_1^{\#1} + \alpha\beta$	0	$-\frac{\sqrt{2}}{t_1+k^2t_1}$	$-\frac{i\sqrt{2}k}{t_1+k^2t_1}$	0	0	0	0
$\sigma_1^{\#2} + \alpha\beta$	$-\frac{\sqrt{2}}{t_1+k^2t_1}$	$\frac{-2k^2(2r_1+r_5)+t_1}{(1+k^2)^2t_1^2}$	$\frac{-2ik^3(2r_1+r_5)+ik^2t_1}{(1+k^2)^2t_1^2}$	0	0	0	0
$\tau_1^{\#1} + \alpha\beta$	$\frac{i\sqrt{2}k}{t_1+k^2t_1}$	$\frac{i(2k^3(2r_1+r_5)-kt_1)}{(1+k^2)^2t_1^2}$	$\frac{-2k^4(2r_1+r_5)+k^2t_1}{(1+k^2)^2t_1^2}$	0	0	0	0
$\sigma_1^{\#1} + \alpha$	0	0	0	$\frac{1}{k^2(r_1+r_5)}$	$-\frac{1}{\sqrt{2}(k^2+2k^4)(r_1+r_5)}$	0	$-\frac{i}{k(1+2k^2)(r_1+r_5)}$
$\sigma_1^{\#2} + \alpha$	0	0	0	$-\frac{1}{\sqrt{2}(k^2+2k^4)(r_1+r_5)}$	$\frac{6k^2(r_1+r_5)+t_1}{2(k+2k^3)^2(r_1+r_5)t_1}$	0	$\frac{i(6k^2(r_1+r_5)+t_1)}{\sqrt{2}k(1+2k^2)^2(r_1+r_5)t_1}$
$\tau_1^{\#1} + \alpha$	0	0	0	0	0	0	0
$\tau_1^{\#2} + \alpha$	0	0	0	$\frac{i}{k(1+2k^2)(r_1+r_5)}$	$-\frac{i(6k^2(r_1+r_5)+t_1)}{\sqrt{2}k(1+2k^2)^2(r_1+r_5)t_1}$	0	$\frac{6k^2(r_1+r_5)+t_1}{(1+2k^2)^2(r_1+r_5)t_1}$

	$\omega_1^{\#1} + \alpha\beta$	$\omega_1^{\#2} + \alpha\beta$	$f_1^{\#1} + \alpha\beta$	$\omega_1^{\#1} - \alpha$	$\omega_1^{\#2} - \alpha$	$f_1^{\#1} - \alpha$	$f_1^{\#2} - \alpha$
$\omega_1^{\#1} + \alpha\beta$	$k^2(2r_1 + r_5) - \frac{t_1}{2}$	$-\frac{t_1}{\sqrt{2}}$	$-\frac{ikt_1}{\sqrt{2}}$	0	0	0	0
$\omega_1^{\#2} + \alpha\beta$	$-\frac{t_1}{\sqrt{2}}$	0	0	0	0	0	0
$f_1^{\#1} + \alpha\beta$	$\frac{ikt_1}{\sqrt{2}}$	0	0	0	0	0	0
$\omega_1^{\#1} - \alpha$	0	0	0	$k^2(r_1 + r_5) + \frac{t_1}{6}$	$\frac{t_1}{3\sqrt{2}}$	0	$\frac{ikt_1}{3}$
$\omega_1^{\#2} - \alpha$	0	0	0	$\frac{t_1}{3\sqrt{2}}$	$\frac{t_1}{3}$	0	$\frac{1}{3}i\sqrt{2}kt_1$
$f_1^{\#1} - \alpha$	0	0	0	0	0	0	0
$f_1^{\#2} - \alpha$	0	0	0	$-\frac{1}{3}ikt_1$	$-\frac{1}{3}i\sqrt{2}kt_1$	0	$\frac{2k^2t_1}{3}$

$\omega_2^{\#1} + \alpha\beta$	$\frac{t_1}{2}$	$-\frac{i k t_1}{\sqrt{2}}$	0	$\omega_2^{\#1} f_2^{\#1} + \alpha\beta x$
$f_2^{\#1} + \alpha\beta$	$\frac{i k t_1}{\sqrt{2}}$	$k^2 t_1$	0	
$\omega_2^{\#1} + \alpha\beta x$	0	0	$k^2 r_1 + \frac{t_1}{2}$	

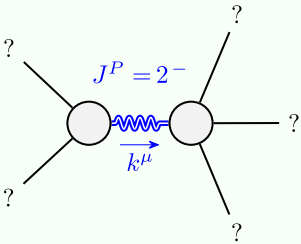
$\sigma_0^{\#1} +$	0	0	0	0	$\sigma_0^{\#1}$
$\tau_0^{\#1} +$	0	0	0	0	
$\tau_0^{\#2} +$	0	0	0	0	
$\sigma_0^{\#1} +$	0	0	0	$-\frac{1}{t_1}$	

$$\begin{aligned} \text{Quadratic (free) action} \\ S = & \iiint \left(\frac{1}{6} (2t_1 \omega_{\alpha}^{\alpha} \omega_{,\theta}^{\theta} + 6 f^{\alpha\beta} \tau_{\alpha\beta} + 6 \omega^{\alpha\beta\chi} \sigma_{\alpha\beta\chi} - 4t_1 \omega_{\alpha}^{\theta} \partial_{,\theta} \omega^{\alpha} + 4t_1 \omega_{,\theta}^{\theta} \right. \\ & \partial f_{\alpha}^{\alpha} - 2t_1 \partial_{,\theta} \partial f_{\theta}^{\theta} \partial f_{\alpha}^{\alpha} - 2t_1 \partial_{,\theta} \partial f_{\alpha}^{\alpha} \partial_{\theta} f_{\theta}^{\theta} + 4t_1 \partial_{,\theta} f_{\alpha}^{\alpha} \partial_{\theta} f_{\theta}^{\theta} - 6t_1 \partial_{\alpha} f_{,\theta} \partial^{\theta} f_{\alpha}^{\alpha} - \\ & 3t_1 \partial_{\alpha} f_{\theta} \partial^{\theta} f_{\alpha}^{\alpha} + 3t_1 \partial_{,\theta} f_{\alpha}^{\alpha} \partial^{\theta} f_{\alpha}^{\alpha} + 3t_1 \partial_{\theta} f_{,\alpha} \partial^{\theta} f_{\alpha}^{\alpha} + \\ & 6t_1 \omega_{\alpha\theta} (\omega^{\alpha\theta} + 2 \partial^{\theta} f^{\alpha\theta}) - 8r_1 \partial_{\beta} \omega_{\alpha\theta} \partial^{\theta} \omega^{\alpha\beta} + 4r_1 \partial_{\beta} \omega_{\alpha\theta} \partial^{\theta} \omega^{\alpha\beta} - 16r_1 \\ & \partial_{\beta} \omega_{,\theta\alpha} \partial^{\theta} \omega^{\alpha\beta} - 4r_1 \partial_{,\theta} \omega_{\alpha\beta} \partial^{\theta} \omega^{\alpha\beta} + 4r_1 \partial_{\theta} \omega_{\alpha\beta} \partial^{\theta} \omega^{\alpha\beta} + 4r_1 \partial_{\theta} \omega_{\alpha\beta} \partial^{\theta} \omega^{\alpha\beta} + \\ & 6r_5 \partial_{,\theta} \omega_{\theta}^{\kappa} \partial^{\theta} \omega_{\kappa}^{\alpha} - 6r_5 \partial_{\theta} \omega_{,\kappa}^{\kappa} \partial^{\theta} \omega_{\alpha}^{\alpha} - 6r_5 \partial_{\alpha} \omega^{\alpha\theta} \partial_{\kappa} \omega_{,\theta}^{\kappa} + 12r_5 \partial^{\theta} \omega_{\alpha}^{\alpha} \\ & \left. \partial_{\kappa} \omega_{,\theta}^{\kappa} + 6r_5 \partial_{\alpha} \omega^{\alpha\theta} \partial_{\kappa} \omega_{\theta}^{\kappa} - 12r_5 \partial^{\theta} \omega^{\alpha\theta} \partial_{\kappa} \omega_{\theta}^{\kappa} \right) [t, x, y, z] dz dy dx dt \end{aligned}$$

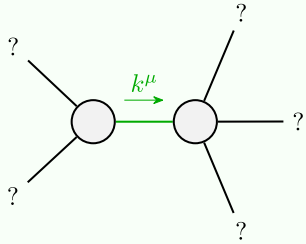
$\omega_0^{#1+}$	0	0	0	0
$f_0^{#1+}$	0	0	0	0
$f_0^{#2+}$	0	0	0	0
$\omega_0^{#1-}$	0	0	0	$-t_1$

Source constraints/gauge generators	SO(3) irreps	Multiplicities
	$\sigma_{0+}^{\#1} = 0$	1
	$\tau_{0+}^{\#1} = 0$	1
	$\tau_{0+}^{\#2} = 0$	1
	$\tau_{1-}^{\#2\alpha} + 2\,i\,k\,\sigma_{1-}^{\#2\alpha} = 0$	3
	$\tau_{1-}^{\#1\alpha} = 0$	3
	$\tau_{1+}^{\#1\alpha\beta} + i\,k\,\sigma_{1+}^{\#2\alpha\beta} = 0$	3
	$\tau_{2+}^{\#1\alpha\beta} - 2\,i\,k\,\sigma_{2+}^{\#1\alpha\beta} = 0$	5
	Total constraints:	17

Massive and massless spectra



Massive particle	
Pole residue:	$-\frac{1}{r_1} > 0$
Polarisations:	5
Square mass:	$-\frac{t_1}{2r_1} > 0$
Spin:	2
Parity:	Odd



Quadratic pole	
Pole residue:	$-\frac{1}{(r_1+r_5)t_1^2} > 0$
Polarisations:	2

Unitarity conditions

$$r_1 < 0 \ \&\& \ r_5 < -r_1 \ \&\& \ t_1 > 0$$