	$\sigma_{1}^{\#1}{}_{\alpha\beta}$	$\sigma_{1}^{\#2}{}_{\alpha\beta}$	$\tau_{1}^{\#1}_{\alpha\beta}$	$\sigma_{1^{-}\alpha}^{\#1}$	$\sigma_{1}^{\#2}{}_{\alpha}$	$\tau_{1}^{\#1}{}_{\alpha}$	$\tau_{1}^{\#2}{}_{\alpha}$
$\sigma_{1}^{\#1} + \alpha \beta$		$-\frac{\sqrt{2}}{k^2(1+k^2)(2r_3+r_5)}$	$-\frac{i\sqrt{2}}{k(1+k^2)(2r_3+r_5)}$	0	0	0	0
$+^{\alpha\beta}$	$\sigma_{1}^{#2} + \alpha \beta = \frac{\sqrt{2}}{\kappa^2 (1 + \kappa^2) (2 r_3 + r_5)}$	$\frac{3k^2(2r_3+r_5)+2t_2}{(k+k^3)^2(2r_3+r_5)t_2}$	$\frac{i(3k^2(2r_3+r_5)+2t_2)}{k(1+k^2)^2(2r_3+r_5)t_2}$	0	0	0	0
$\tau_1^{\#_1} + \alpha \beta$	$\frac{i\sqrt{2}}{k(1+k^2)(2r_3+r_5)}$	$-\frac{i(3k^2(2r_3+r_5)+2t_2)}{k(1+k^2)^2(2r_3+r_5)t_2}$	$\frac{3k^2(2r_3+r_5)+2t_2}{(1+k^2)^2(2r_3+r_5)t_2}$	0	0	0	0
$\sigma_{1}^{\#1} +^{lpha}$	0	0	0	$\frac{2}{k^2 (r_3 + 2 r_5)}$	$\frac{2\sqrt{2}}{k^2(1+2k^2)(r_3+2r_5)}$	0	$\frac{4i}{k(1+2k^2)(r_3+2r_5)}$
$\sigma_{1}^{\#2} +^{lpha}$	0	0	0	$\frac{2\sqrt{2}}{k^2(1+2k^2)(r_3+2r_5)}$	$\frac{3k^2(r_3+2r_5)+4t_3}{(k+2k^3)^2(r_3+2r_5)t_3}$	0	$\frac{i\sqrt{2}(3k^2(r_3+2r_5)+4t_3)}{k(1+2k^2)^2(r_3+2r_5)t_3}$
$\tau_{1}^{\#_{1}} +^{\alpha}$	0	0	0	0	0	0	0
$\tau_1^{\#2} + ^{\alpha}$	0	0	0	$-\frac{4 i}{k (1+2 k^2) (r_3+2 r_5)}$	$-\frac{i\sqrt{2}(3k^2(r_3+2r_5)+4t_3)}{k(1+2k^2)^2(r_3+2r_5)t_3}$	0	$\frac{6k^2(r_3+2r_5)+8t_3}{(1+2k^2)^2(r_3+2r_5)t_3}$

Parity:

Pole residue:

 $r_3(2r_3+r_5)(r_3+2r_5)p^2 > 0$

Quadratic pole

Polarisations: |2

Spin:

Square mass:

 $-\frac{t_2}{r_2} > 0$

Polarisations:

$\frac{2}{3}r_{2}\partial^{\beta}\omega_{\lambda}^{\lambda\alpha}\partial_{\lambda}\omega_{\alpha\beta}^{\ \prime} - 4r_{3}\partial^{\beta}\omega_{\lambda}^{\lambda\alpha}\partial_{\lambda}\omega_{\alpha\beta}^{\ \prime} - \frac{1}{2}r_{3}\partial_{\alpha}\omega_{\lambda}^{\alpha}\partial_{\lambda}\omega^{\theta\kappa} + r_{5}\partial_{\alpha}\omega_{\lambda}^{\alpha}\partial_{\lambda}\omega^{\theta\kappa} + r_{5}\partial_{\alpha}\omega^{\kappa}\partial_{\lambda}\omega^{\phi\kappa} + r_{5}\partial_{\alpha}\omega^{\kappa}\partial_{\lambda}\omega^{\kappa} + r_{5}\partial_{\alpha}\omega^{\kappa}\partial_{\lambda}\omega^{\kappa} + r_{5}\partial_{\alpha}\omega^{\kappa}\partial_{\lambda}\omega^{\kappa} + r_{5}\partial_{\alpha}\omega^{\kappa}\partial_{\lambda}\omega^{\kappa} + r_{5}\partial_{\alpha}\omega^{\kappa}\partial_{\lambda}\omega^{\kappa} + r_{5}\partial_{\alpha}\omega^{\kappa}\partial_{\lambda}\omega^{\kappa}\partial_{\lambda}\omega^{\kappa} + r_{5}\partial_{\alpha}\omega^{\kappa}\partial_{\alpha}\omega^{\kappa}\partial_{\lambda}\omega^{\kappa} + r_{5}\partial_{\alpha}\omega^{\kappa}\partial_{\alpha}\omega^{\kappa}\partial_{\alpha}\omega^{\kappa} + r_{5}\partial_{\alpha}\omega^{\kappa}\partial_{\alpha}\omega^{$
$\frac{1}{6}t_2\partial_{\kappa}f_{\theta}^{\ \lambda}\partial^{\kappa}f_{\lambda}^{\ \theta} + \frac{1}{6}t_2\partial_{\kappa}f^{\lambda}_{\ \theta}\partial^{\kappa}f_{\lambda}^{\ \theta} + \frac{2}{3}t_3\partial^{\alpha}f^{\lambda}_{\ \alpha}\partial^{\kappa}f_{\lambda\kappa} + \frac{1}{6}t_2\partial_{\kappa}\omega_{\alpha\beta\theta} + \frac{2}{2}t_2\partial_{\kappa}\omega_{\alpha\beta\theta} - \frac{2}{2}t_2\partial^{\beta}\omega_{\alpha\lambda}^{\ \alpha\lambda}\partial_{\lambda}\omega_{\alpha\beta}^{\ \beta} + \frac{1}{2}t_2\partial_{\kappa}\omega_{\alpha\beta\theta} - \frac{2}{2}t_2\partial^{\beta}\omega_{\alpha\lambda}^{\ \alpha\lambda}\partial_{\lambda}\omega_{\alpha\beta}^{\ \beta} + \frac{1}{2}t_2\partial_{\kappa}\omega_{\alpha\beta\theta} - \frac{2}{2}t_2\partial^{\beta}\omega_{\alpha\lambda}^{\ \alpha\lambda}\partial_{\lambda}\omega_{\alpha\beta}^{\ \beta} + \frac{1}{2}t_2\partial_{\kappa}\omega_{\alpha\beta\theta} + \frac{2}{2}t_2\partial_{\kappa}\omega_{\alpha\beta\theta} - \frac{2}{2}t_2\partial^{\beta}\omega_{\alpha\lambda}^{\ \alpha\lambda}\partial_{\lambda}\omega_{\alpha\beta}^{\ \beta} + \frac{1}{2}t_2\partial_{\kappa}\omega_{\alpha\beta\theta} - \frac{2}{2}t_2\partial^{\beta}\omega_{\alpha\lambda}^{\ \alpha\lambda}\partial_{\lambda}\omega_{\alpha\beta}^{\ \beta} + \frac{1}{2}t_2\partial_{\kappa}\omega_{\alpha\beta\theta} - \frac{2}{2}t_2\partial^{\beta}\omega_{\alpha\lambda}^{\ \alpha\lambda}\partial_{\lambda}\omega_{\alpha\beta}^{\ \beta} + \frac{1}{2}t_2\partial_{\kappa}\omega_{\alpha\beta\theta} - \frac{2}{2}t_2\partial^{\beta}\omega_{\alpha\lambda}^{\ \alpha\lambda}\partial_{\lambda}\omega_{\alpha\beta}^{\ \beta} + \frac{1}{2}t_2\partial_{\kappa}\omega_{\alpha\beta\theta}^{\ \beta}\partial_{\kappa}\omega_{\alpha\beta\theta}^{\ \beta} + \frac{2}{2}t_2\partial_{\kappa}\omega_{\alpha\beta\theta}^{\ \beta}\partial_{\kappa}\omega_{\alpha\beta\theta}^{\ \beta}\partial_{\kappa}\omega_{\alpha\beta}^{\ \beta}\partial_{\kappa}\omega_{\alpha$
$\frac{2}{3}t_{2} \omega_{\theta K_{I}} \partial^{K} f^{I\theta} + \frac{2}{3}t_{3} \omega_{I\alpha}^{\alpha} \partial^{K} f^{I}_{\kappa} + \frac{2}{3}t_{3} \omega_{I\lambda}^{\lambda} \partial^{K} f^{I}_{\kappa} - \frac{1}{6}t_{2} \partial^{\alpha} f^{\lambda}_{\kappa} \partial^{K} f_{\lambda}$ $\frac{1}{6}t_{2} \partial_{K} f^{\lambda}_{\theta} \partial^{K} f^{\lambda}_{\lambda} + \frac{1}{6}t_{2} \partial_{K} f^{\lambda}_{\theta} \partial^{K} f^{\lambda}_{\lambda} + \frac{2}{3}t_{3} \partial^{\alpha} f^{\lambda}_{\alpha} \partial^{K} f_{\lambda K} +$ $\frac{1}{6}r_{2} \partial_{K} \omega^{\alpha \beta \theta} \partial^{K} \omega_{\alpha \beta \theta} + \frac{2}{2}r_{2} \partial_{K} \omega^{\theta \alpha \beta} \partial^{K} \omega_{\alpha \beta \theta} - \frac{2}{2}r_{2} \partial^{\beta} \omega_{\alpha \lambda}^{\lambda} \partial_{\lambda} \omega_{\alpha \beta}^{I} +$
$\frac{2}{3}t_{3}\partial_{\kappa}f^{\lambda}{}_{\lambda}\partial^{\kappa}f'{}_{l}{}_{l}{}_{l}{}_{l}{}_{2}\omega_{l}\theta_{\kappa}\partial^{\kappa}f^{l}\theta_{}{}_{l}{}_{l}{}_{2}^{2}t_{2}\omega_{l}\kappa\theta}\partial^{\kappa}f^{l}\theta_{}{}_{l}{}_{l}{}_{2}^{2}\omega_{l}\kappa\theta}\partial^{\kappa}f^{l}\theta_{}{}_{l}{}_{l}{}_{3}^{2}t_{2}\omega_{l}\kappa\theta}\partial^{\kappa}f^{l}{}_{l$
$\frac{1}{6}t_{2}\partial^{\alpha}f^{\lambda}_{k}\partial^{k}f_{\alpha\lambda} - \frac{2}{3}t_{3}\omega_{k\alpha}^{\alpha}\partial^{k}f'_{l} - \frac{2}{3}t_{3}\omega_{k\lambda}^{\lambda}\partial^{k}f'_{l} - \frac{4}{3}t_{3}\partial^{\alpha}f_{k\alpha}\partial^{k}f'_{l}$ $\frac{2}{3}t_{3}\partial_{k}f^{\lambda}_{\lambda}\partial^{k}f'_{l} + \frac{1}{3}t_{2}\omega_{l\theta k}\partial^{k}f'^{l\theta} - \frac{2}{3}t_{2}\omega_{l\kappa\theta}\partial^{k}f'^{l\theta} - \frac{1}{3}t_{2}\omega_{\theta lk}\partial^{k}f'^{l\theta}$ $\frac{2}{3}t_{2}\omega_{\theta k l}\partial^{k}f'^{l\theta} + \frac{2}{3}t_{3}\omega_{l\alpha}^{\alpha}\partial^{k}f'_{k} + \frac{2}{3}t_{3}\omega_{l\lambda}^{\lambda}\partial^{k}f'_{k} - \frac{1}{6}t_{2}\partial^{\alpha}f^{\lambda}\partial^{k}f$ $\frac{1}{3}t_{2}\partial_{k}f^{\lambda}\partial^{k}f^{\lambda}\partial^{k}f^{\lambda}\partial^{k}f^{\lambda}\partial^{k}f'^{\lambda}\partial^{k}f'^{\lambda}\partial^{k}f'^{\lambda}\partial^{k}f'^{\lambda}\partial^{k}f'^{\lambda}\partial^{k}f'^{\lambda}\partial^{k}f'^{\lambda}\partial^{k}f'^{\lambda}\partial^{k}f^{\lambda}\partial^$
$2 r_5 \partial_{\theta} \omega_{\lambda}{}^{\alpha} _{\alpha} \partial_{\kappa} \omega^{\kappa \lambda \theta} + \frac{1}{6} t_2 \partial_{\alpha} f_{\theta \kappa} \partial^{\kappa} f_{\alpha}{}^{\theta} - \frac{1}{6} t_2 \partial^{\alpha} f_{\kappa \theta} \partial^{\kappa} f_{\alpha}{}^{\theta} +$ $\frac{1}{6} t_2 \partial^{\alpha} f^{\lambda} _{\kappa} \partial^{\kappa} f_{\alpha \lambda} - \frac{2}{3} t_3 \omega_{\kappa \alpha}{}^{\alpha} \partial^{\kappa} f'_{\kappa} - \frac{2}{3} t_3 \omega_{\kappa \lambda}{}^{\lambda} \partial^{\kappa} f'_{\kappa} - \frac{4}{3} t_3 \partial^{\alpha} f_{\kappa \alpha} \partial^{\kappa} f'_{\kappa}$ $\frac{2}{3} t_3 \partial_{\kappa} f^{\lambda} _{\lambda} \partial^{\kappa} f'_{\kappa} + \frac{1}{3} t_2 \omega_{\kappa \theta \kappa} \partial^{\kappa} f'_{\kappa} - \frac{2}{3} t_2 \omega_{\kappa \theta} \partial^{\kappa} f'_{\kappa} - \frac{1}{3} t_2 \omega_{\theta \kappa} \partial^{\kappa} f'_{\kappa}$ $\frac{2}{3} t_2 \omega_{\theta \kappa} \partial^{\kappa} f'_{\kappa} + \frac{2}{3} t_3 \omega_{\kappa} \partial^{\kappa} f'_{\kappa} + \frac{2}{3} t_3 \omega_{\kappa} \partial^{\lambda} f'_{\kappa} - \frac{1}{3} t_2 \partial^{\alpha} f'_{\kappa} \partial^{\kappa} f'_{\kappa}$ $\frac{1}{3} t_2 \partial_{\kappa} f_{\theta} \partial^{\kappa} f_{\lambda} + \frac{1}{6} t_2 \partial_{\kappa} f^{\lambda} \partial^{\kappa} f'_{\lambda} + \frac{2}{3} t_3 \partial^{\alpha} f^{\lambda} \partial^{\kappa} f'_{\kappa} + \frac{1}{6} t_2 \partial^{\kappa} f'_{\lambda} \partial^{\kappa} f'_{\lambda} + \frac{2}{3} t_3 \partial^{\alpha} f'_{\lambda} \partial^{\kappa} f'_{\lambda} + \frac{1}{6} t_2 \partial^{\kappa} \omega_{\alpha \beta \theta} + \frac{2}{3} t_2 \partial^{\kappa} \omega_{\alpha \beta \theta} - \frac{2}{3} t_2 \partial^{\beta} \omega_{\kappa} \partial^{\lambda} \partial^{\lambda} \omega_{\kappa} + \frac{1}{6} t_2 \partial^{\kappa} \omega_{\alpha \beta \theta} + \frac{2}{3} t_2 \partial^{\kappa} \omega_{\alpha \beta \theta} - \frac{2}{3} t_2 \partial^{\beta} \omega_{\kappa} \partial^{\lambda} \partial^{\lambda} \omega_{\kappa} + \frac{1}{6} t_2 \partial^{\kappa} \omega_{\alpha \beta \theta} + \frac{2}{3} t_2 \partial^{\kappa} \omega_{\alpha \beta \theta} - \frac{2}{3} t_2 \partial^{\beta} \omega_{\kappa} \partial^{\lambda} \partial^{\lambda} \partial^{\kappa} f'_{\lambda} + \frac{1}{6} t_2 \partial^{\kappa} \omega_{\alpha \beta \theta} + \frac{2}{3} t_2 \partial^{\kappa} \omega_{\alpha \beta \theta} - \frac{2}{3} t_2 \partial^{\beta} \omega_{\kappa} \partial^{\lambda} \partial^{\lambda} \partial^{\kappa} f'_{\lambda} + \frac{1}{6} t_2 \partial^{\kappa} \omega_{\alpha \beta \theta} \partial^{\kappa} \omega_{\alpha \beta \theta} - \frac{2}{3} t_2 \partial^{\beta} \omega_{\alpha \beta} \partial^{\lambda} \partial^{\lambda} \partial^{\kappa} f'_{\lambda} + \frac{1}{6} t_2 \partial^{\kappa} \omega_{\alpha \beta \theta} \partial^{\kappa} \omega_{\alpha \beta \theta} - \frac{2}{3} t_2 \partial^{\beta} \omega_{\alpha \beta} \partial^{\lambda} \partial^{\lambda} \partial^{\lambda} \partial^{\kappa} f'_{\lambda} + \frac{1}{6} t_2 \partial^{\kappa} \omega_{\alpha \beta \theta} \partial^{\kappa} \omega_{\alpha \beta \theta} - \frac{2}{3} t_2 \partial^{\beta} \omega_{\alpha \beta} \partial^{\lambda} \partial^{\lambda} \partial^{\lambda} \partial^{\lambda} f'_{\lambda} + \frac{1}{6} t_2 \partial^{\alpha} \omega_{\alpha \beta} \partial^{\lambda} \partial^{\lambda} \partial^{\lambda} \partial^{\lambda} f'_{\lambda} + \frac{1}{6} t_2 \partial^{\alpha} \partial^{\lambda} \partial^{\lambda}$
$\frac{1}{2} r_{3} \partial_{\alpha} \omega_{\lambda}^{\alpha} \partial_{\beta} \omega^{\kappa \lambda \theta} - r_{5} \partial_{\alpha} \omega_{\lambda}^{\alpha} \partial_{\beta} \omega^{\kappa \lambda \theta} + r_{3} \partial_{\theta} \omega_{\lambda}^{\alpha} \partial_{\beta} \omega^{\kappa \lambda \theta} +$ $2 r_{5} \partial_{\theta} \omega_{\lambda}^{\alpha} \partial_{\kappa} \omega^{\kappa \lambda \theta} + \frac{1}{6} t_{2} \partial^{\alpha} f_{\theta \kappa} \partial^{\kappa} f_{\alpha}^{\theta} - \frac{1}{6} t_{2} \partial^{\alpha} f_{\kappa \theta} \partial^{\kappa} f_{\alpha}^{\theta} +$ $\frac{1}{6} t_{2} \partial^{\alpha} f^{\lambda}_{\kappa} \partial^{\kappa} f_{\alpha \lambda} - \frac{2}{3} t_{3} \omega_{\kappa \alpha}^{\alpha} \partial^{\kappa} f'_{1} - \frac{2}{3} t_{3} \omega_{\kappa \lambda}^{\lambda} \partial^{\kappa} f'_{1} - \frac{4}{3} t_{3} \partial^{\alpha} f_{\kappa \theta}^{\kappa} \partial^{\kappa} f'_{1}$ $\frac{2}{3} t_{3} \partial_{\kappa} f^{\lambda}_{\lambda} \partial^{\kappa} f'_{1} + \frac{1}{3} t_{2} \omega_{1 \theta \kappa} \partial^{\kappa} f'_{1 \theta} - \frac{2}{3} t_{2} \omega_{1 \kappa \theta}^{\lambda} \partial^{\kappa} f'_{1 \theta} - \frac{1}{3} t_{2} \omega_{\theta 1 \kappa}^{\mu} \partial^{\kappa} f'_{1 \theta}$ $\frac{2}{3} t_{2} \omega_{\theta \kappa_{1}} \partial^{\kappa} f'_{1} + \frac{1}{3} t_{2} \omega_{1 \theta \kappa}^{\lambda} \partial^{\kappa} f'_{1} + \frac{2}{3} t_{3} \omega_{1 \lambda}^{\lambda} \partial^{\kappa} f'_{1} + \frac{2}{3} t_{3} \omega_{1 \lambda}^{\lambda} \partial^{\kappa} f'_{1} + \frac{1}{3} t_{2} \partial^{\alpha} f'_{1} \partial^{\kappa} f'_{1} + \frac{2}{3} t_{3} \omega_{1 \lambda}^{\lambda} \partial^{\kappa} f'_{1} + \frac{1}{3} t_{2} \partial^{\alpha} f'_{1} \partial^{\kappa} f'_{1} + \frac{2}{3} t_{3} \partial^{\alpha} f'_{1} \partial^{\kappa} f'_{1} + \frac{1}{3} t_{2} \partial^{\alpha} f'_{1} \partial^{\kappa} f'_{1} + \frac{2}{3} t_{3} \partial^{\alpha} f'_{1} \partial^{\kappa} f'_{1} \partial^{\kappa} f'_{1} + \frac{2}{3} t_{3} \partial^{\alpha} f'_{1} \partial^{\kappa} f'_{1} \partial^{$
$ r_{5} \partial_{\alpha} \omega_{\lambda}^{\alpha} \partial_{\beta} \omega^{\theta k \lambda} - \frac{1}{2} r_{3} \partial_{\theta} \omega_{\lambda}^{\alpha} \partial_{\kappa} \omega^{\theta k \lambda} + r_{5} \partial_{\theta} \omega_{\lambda}^{\alpha} \partial_{\kappa} \omega^{\theta k \lambda} - \frac{1}{2} r_{3} \partial_{\theta} \omega_{\lambda}^{\alpha} \partial_{\kappa} \omega^{\theta k \lambda} + r_{5} \partial_{\theta} \omega_{\lambda}^{\alpha} \partial_{\kappa} \omega^{\theta k \lambda} - \frac{1}{2} r_{5} \partial_{\alpha} \omega_{\lambda}^{\alpha} \partial_{\kappa} \omega^{k \lambda \theta} + r_{3} \partial_{\theta} \omega_{\lambda}^{\alpha} \partial_{\kappa} \omega^{k \lambda \theta} + \frac{1}{2} r_{5} \partial_{\alpha} \omega_{\lambda}^{\alpha} \partial_{\kappa} \omega^{k \lambda \theta} + \frac{1}{2} r_{5} \partial_{\alpha} f_{\alpha}^{\alpha} \partial_{\kappa} f_{\alpha}^{\alpha} + \frac{1}{2} r_{5} \partial_{\alpha} f_{\alpha}^{\alpha} \partial_{\kappa} f_{\alpha}^{\alpha} - \frac{1}{2} r_{5} \partial_{\alpha} f_{\kappa}^{\alpha} \partial_{\kappa} f_{\alpha}^{\alpha} + \frac{1}{2} r_{5} \partial_{\alpha} f_{\kappa}^{\alpha} \partial_{\kappa} f_{\alpha}^{\alpha} - \frac{1}{2} r_{5} \partial_{\alpha} f_{\kappa}^{\alpha} \partial_{\kappa} f_{\alpha}^{\alpha} + \frac{1}{2} r_{5} \partial_{\alpha} f_{\kappa}^{\alpha} \partial_{\kappa} f_{\alpha}^{\alpha} - \frac{1}{2} r_{5} \partial_{\alpha} f_{\kappa}^{\alpha} \partial_{\kappa} f_{\alpha}^{\alpha} - \frac{1}{2} r_{5} \partial_{\alpha} f_{\kappa}^{\alpha} \partial_{\kappa} f_{\alpha}^{\alpha} \partial_{\kappa} f_{\alpha}^{\alpha} + \frac{1}{2} r_{5} \partial_{\kappa} f_{\alpha}^{\alpha} \partial_{\kappa} f_{\alpha}^{\alpha} - \frac{1}{2} r_{5} \partial_{\alpha} f_{\alpha}^{\alpha} \partial_{\kappa} f_{\alpha}^{\alpha} - \frac{1}{2} r_{5} \partial_{\alpha} f_{\alpha}^{\alpha} \partial_{\kappa} f_{\alpha}^{\alpha} + \frac{1}{2} r_{5} \partial_{\kappa} \omega^{\alpha} \partial_{\kappa} f_{\alpha}^{\alpha} + \frac{1}{2} r_{5} \partial_{\kappa} \omega^{\alpha} \partial_{\kappa} f_{\alpha}^{\alpha} + \frac{1}{2} r_{5} \partial_{\kappa} \omega^{\alpha} \partial_{\kappa} f_{\alpha}^{\alpha} \partial_{\kappa} f_{\alpha}^{\alpha} + \frac{1}{2} r_{5} \partial_{\kappa} \omega^{\alpha} \partial_{\kappa} f_{\alpha}^{\alpha} \partial_{\kappa} f_{\alpha}^{\alpha} \partial_{\kappa} f_{\alpha}^{\alpha} \partial_{\kappa} f_{\alpha}^{\alpha} + \frac{1}{2} r_{5} \partial_{\kappa} \omega^{\alpha} \partial_{\kappa} f_{\alpha}^{\alpha} \partial$
$\frac{1}{3} r_2 \partial_{\theta} \omega_{\alpha\beta}^{\kappa} \partial_{\kappa} \omega^{\alpha\beta\theta} - \frac{2}{3} r_2 \partial_{\theta} \omega_{\alpha\beta}^{\kappa} \partial_{\kappa} \omega^{\theta\alpha\beta} + \frac{1}{2} r_3 \partial_{\alpha} \omega_{\lambda}^{\alpha} \partial_{\beta} \omega^{\theta\kappa\lambda} - \frac{1}{2} r_3 \partial_{\theta} \omega_{\lambda}^{\alpha} \partial_{\kappa} \omega^{\theta\kappa\lambda} + r_5 \partial_{\theta} \omega_{\lambda}^{\alpha} \partial_{\kappa} \omega^{\theta\kappa\lambda} - \frac{1}{2} r_3 \partial_{\theta} \omega_{\lambda}^{\alpha} \partial_{\kappa} \omega^{\theta\kappa\lambda} + r_5 \partial_{\theta} \omega_{\lambda}^{\alpha} \partial_{\kappa} \omega^{\theta\kappa\lambda} - \frac{1}{2} r_3 \partial_{\theta} \omega_{\lambda}^{\alpha} \partial_{\kappa} \omega^{\kappa\lambda\theta} + r_5 \partial_{\theta} \omega_{\lambda}^{\alpha} \partial_{\kappa} \omega^{\kappa\lambda\theta} + \frac{1}{2} r_3 \partial_{\alpha} \omega^{\kappa\lambda\theta} + r_5 \partial_{\theta} \omega_{\lambda}^{\alpha} \partial_{\kappa} \omega^{\kappa\lambda\theta} + \frac{1}{6} r_2 \partial_{\alpha} f_{\kappa} \partial_{\kappa} f_{\kappa}^{\alpha} - \frac{1}{6} r_2 \partial_{\alpha} f_{\kappa} \partial_{\kappa} f_{\kappa}^{\alpha} + \frac{1}{6} r_2 \partial_{\alpha} f_{\kappa} \partial_{\kappa} f_{\kappa}^{\alpha} - \frac{1}{6} r_2 \partial_{\alpha} f_{\kappa} \partial_{\kappa} f_{\kappa}^{\alpha} + \frac{1}{6} r_2 \partial_{\alpha} f_{\kappa} \partial_{\kappa} f_{\kappa}^{\alpha} - \frac{1}{2} r_2 \partial_{\kappa} f_{\kappa}^{\alpha} \partial_{\kappa} f_{\kappa}^{\alpha} - \frac{1}{2} r_2 \partial_{\alpha} f_{\kappa}^{\alpha} \partial_{\kappa} f_{\kappa}^{\alpha} - \frac{1}{2} r_2 \partial_{\alpha} f_{\kappa}^{\alpha} \partial_{\kappa} f_{\kappa}^{\alpha} - \frac{1}{2} r_2 \partial_{\alpha} f_{\kappa}^{\alpha} \partial_{\kappa} f_{\kappa}^{\alpha} + \frac{1}{2} r_2 \partial_{\kappa} f_{\kappa}^{\alpha} \partial_{\kappa} f_{\kappa}^{\alpha} + \frac{1}{2} r_2 \partial_{\kappa} \omega^{\alpha\beta\theta} \partial_{\kappa} \omega_{\alpha\beta\theta} - \frac{1}{2} r_2 \partial_{\beta} \omega_{\alpha}^{\alpha} \partial_{\lambda} \partial_{\kappa}^{\alpha} + \frac{1}{6} r_2 \partial_{\kappa} \omega^{\alpha\beta\theta} \partial_{\kappa} \omega_{\alpha\beta\theta} + \frac{1}{2} r_2 \partial_{\kappa} \omega^{\alpha\beta\theta} \partial_{\kappa} \omega_{\alpha\beta\theta} - \frac{1}{2} r_2 \partial_{\beta} \omega_{\alpha\beta}^{\alpha} - \frac{1}{2} r_2 \partial_{\beta} \omega_{\alpha\beta}^{\alpha} + \frac{1}{2} r_2 \partial_{\kappa} \omega^{\alpha\beta\theta} \partial_{\kappa} \omega_{\alpha\beta\theta} - \frac{1}{2} $
$\frac{1}{2} r_3 \partial_i \omega^{k,\lambda} \partial^i \omega_{\lambda}^{\alpha} - r_5 \partial_i \omega^{k,\lambda} \partial^i \omega_{\lambda}^{\alpha} + \frac{2}{3} r_2 \partial^{\beta} \omega^{\beta \alpha} \partial^{\beta} \omega_{\alpha\beta}^{\kappa} - \frac{1}{2} r_3 \partial_i \omega^{k,\lambda} \partial^{\beta} \omega_{\alpha\beta}^{\kappa} + \frac{1}{2} r_3 \partial_{\alpha} \omega_{\lambda}^{\alpha} \partial_{\beta} \omega_{\beta\beta}^{\kappa} - \frac{1}{3} r_2 \partial_{\theta} \omega_{\alpha\beta}^{\kappa} + \frac{1}{2} r_3 \partial_{\theta} \omega_{\lambda}^{\alpha} \partial_{\kappa} \omega^{\theta \kappa \lambda} - \frac{1}{2} r_3 \partial_{\theta} \omega_{\lambda}^{\alpha} \partial_{\kappa} \omega^{\theta \kappa \lambda} + r_5 \partial_{\theta} \omega_{\lambda}^{\alpha} \partial_{\kappa} \omega^{\theta \kappa \lambda} - \frac{1}{2} r_3 \partial_{\theta} \omega_{\lambda}^{\alpha} \partial_{\kappa} \omega^{k \lambda \theta} + r_3 \partial_{\theta} \omega_{\lambda}^{\alpha} \partial_{\kappa} \omega^{k \lambda \theta} + \frac{1}{2} r_3 \partial_{\alpha} \omega^{k \lambda}^{\alpha} + r_3 \partial_{\theta} \omega_{\lambda}^{\alpha} \partial_{\kappa} \omega^{k \lambda \theta} + \frac{1}{2} r_3 \partial_{\alpha} \omega^{k \lambda}^{\alpha} + \frac{1}{2} r_2 \partial_{\alpha} f_{\beta} \partial_{\kappa} f_{\beta}^{\kappa} + \frac{1}{2} r_2 \partial_{\alpha} f_{\beta}^{\kappa} \partial_{\kappa} f_{\beta}^{\kappa} + \frac{1}{2} r_2 \partial_{\alpha} f_{\beta}^{\kappa} \partial_{\kappa} f_{\beta}^{\kappa} + \frac{1}{2} r_3 \omega_{\kappa}^{\kappa} \partial_{\kappa} f_{\beta}^{\kappa} + \frac{1}{2} r_3 \partial_{\kappa} f_{\beta}^{\kappa} + $
$\frac{2}{3}t_{3}\omega_{\kappa^{\prime}}^{\alpha\prime}\omega_{\kappa^{\prime}}^{\kappa} + \frac{2}{3}t_{2}\omega_{\kappa^{\prime}}^{\kappa\lambda}\omega_{\kappa^{\prime}}^{\lambda} + \frac{1}{3}t_{2}\omega_{\kappa^{\prime}}^{\lambda}\omega_{\kappa^{\prime}}^{\kappa\lambda}^{\lambda} - \frac{1}{3}t_{2}\omega_{\kappa^{\prime}}^{\kappa\lambda}^{\lambda}\omega_{\kappa^{\prime}}^{\kappa\lambda}^{\lambda} - \frac{1}{3}t_{2}\omega_{\kappa^{\prime}}^{\kappa\lambda}^{\lambda}\omega_{\kappa^{\prime}}^{\lambda} + \frac{1}{3}t_{2}\omega_{\kappa^{\prime}}^{\lambda}\omega_{\kappa^{\prime}}^{\kappa\lambda}^{\lambda} - \frac{1}{2}t_{3}\partial_{\mu}\omega_{\kappa}^{\kappa}\partial_{\mu}\omega_{\kappa}^{\kappa}^{\lambda} - \frac{1}{2}t_{2}\partial_{\theta}\omega_{\kappa}^{\kappa}\partial_{\kappa}^{\lambda}\omega_{\kappa}^{\lambda} + t_{5}\partial_{\theta}\omega_{\lambda}^{\alpha}\partial_{\kappa}\omega_{\kappa}^{\kappa\lambda}^{\lambda} - \frac{1}{2}t_{2}\partial_{\theta}\omega_{\lambda}^{\alpha}\partial_{\kappa}\omega_{\kappa}^{\lambda}^{\lambda} + t_{5}\partial_{\theta}\omega_{\lambda}^{\alpha}\partial_{\kappa}\omega_{\kappa}^{\lambda}^{\lambda} - \frac{1}{2}t_{3}\partial_{\theta}\omega_{\lambda}^{\alpha}\partial_{\kappa}\omega_{\kappa}^{\lambda}^{\lambda} + t_{5}\partial_{\theta}\omega_{\lambda}^{\alpha}\partial_{\kappa}\omega_{\kappa}^{\lambda}^{\lambda} + t_{5}\partial_{\theta}\omega_{\lambda}^{\alpha}\partial_{\kappa}\omega_{\kappa}^{\lambda}^{\lambda} + \frac{1}{2}t_{2}\partial_{\sigma}t_{\lambda}^{\alpha}\partial_{\kappa}\omega_{\kappa}^{\lambda}^{\lambda} + t_{5}\partial_{\theta}\omega_{\lambda}^{\alpha}\partial_{\kappa}\omega_{\kappa}^{\lambda}^{\lambda} + \frac{1}{2}t_{5}\partial_{\sigma}t_{\lambda}^{\alpha}\partial_{\kappa}^{\lambda}^{\lambda} + t_{5}\partial_{\theta}\omega_{\lambda}^{\alpha}\partial_{\kappa}^{\lambda}^{\lambda} + \frac{1}{2}t_{5}\partial_{\sigma}t_{\lambda}^{\lambda}\partial_{\kappa}^{\lambda} + \frac{1}{2}t_{5}\partial_{\sigma}t_{\lambda}^{\lambda}\partial_{\sigma}t_{\lambda}^{\lambda} + \frac{1}{2}t_{5}\partial_{$

 $\omega_{1^{+}\,\alpha\beta}^{\#1}$

 $\omega_{1+}^{\#1} \uparrow^{\alpha\beta} k^2 (2r_3 + r_5) + \frac{2t_2}{3} \frac{\sqrt{2} t_2}{3}$

 $-\frac{1}{3}\,i\,\sqrt{2}\,kt_2$

0

0

0

0

 $\omega_{1}^{\#2}\dagger^{\alpha\beta}$

 $f_{1+}^{\#1}\dagger^{\alpha\beta}$

 $\omega_1^{\#1}\dagger^{\alpha}$

 $\omega_{1}^{#2} \dagger^{\alpha}$

 $f_{1}^{#1} \dagger^{\alpha}$

 $f_1^{#2} \dagger^{\alpha}$

 $\omega_{1}^{\#2}{}_{\alpha\beta}$ $f_{1}^{\#1}{}_{\alpha\beta}$

 $-\frac{1}{3} \bar{l} k t_2$

0

0

0

0

 $\frac{1}{3}\,\bar{l}\,\sqrt{2}\,kt_2$

 $\frac{ikt_2}{3}$

 $\frac{k^2t_2}{3}$

0

0

0

0

 $\omega_{1^-\alpha}^{\#1}$

0

0

0

 $k^2 \left(\frac{r_3}{2} + r_5\right) + \frac{2t_3}{3}$

 $-\frac{\sqrt{2}\ t_3}{3}$

0

 $\frac{2ikt_3}{3}$

 $\omega_{1-\alpha}^{\#2}$ $f_{1-\alpha}^{\#1}$ $f_{1-\alpha}^{\#2}$

0

0

0

0

0

 $-\frac{\sqrt{2}\ t_3}{3}$

<u>t3</u> 3

 $-\frac{1}{3}i\sqrt{2}kt_3$

0

0

0

 $-\frac{2}{3}ikt_3$

0

 $\frac{2k^2t_3}{3}$

Source constraints

 $\tau_{0^{+}}^{\#1} - 2 \, \bar{\imath} \, k \, \sigma_{0^{+}}^{\#1} == 0$

 $\tau_1^{\#1\alpha} == 0$

 $\sigma_2^{\#1\alpha\beta\chi} == 0$

 $\frac{\tau_{2^{+}}^{\#1}\alpha\beta}{\text{Total }\#:} == 0$

 $\tau_{1}^{\#2\alpha} + 2 i k \sigma_{1}^{\#2\alpha} == 0 \quad 3$

 $\tau_{1}^{\#1\,\alpha\beta} + i\,k\,\,\sigma_{1}^{\#2\,\alpha\beta} == 0$ 3

SO(3) irreps

 $\tau_{0^{+}}^{\#2} == 0$

 $0 \quad \boxed{\frac{1}{3} i \sqrt{2} k t_3}$

	$\sigma_{0^+}^{\#1}$	$ au_0^{\#1}$	$ au_0^{\#2}$	$\sigma_0^{\#1}$
$\sigma_{0}^{\#1}$ †	$\frac{1}{(1+2k^2)^2t_3}$	$-\frac{i\sqrt{2} k}{(1+2k^2)^2 t_3}$	0	0
$\tau_{0}^{\#1}$ †	$\frac{i\sqrt{2} k}{(1+2k^2)^2 t_3}$	$\frac{2k^2}{(1+2k^2)^2t_3}$	0	0
$ au_{0^{+}}^{\#2} \dagger$	0	0	0	0
$\sigma_{0}^{\#1}$ †	0	0	0	$\frac{1}{k^2 r_2 + t_2}$

 $\omega_{0^{-}}^{\#1}$

 $f_{0}^{\#1}$

 $\omega_{0+}^{\#1}$

0

 $-i\sqrt{2}kt_3$

0

0 0 0 0

0

0 0

 $i \sqrt{2} kt_3$ 0

	$\omega_{2^{+}\alpha\beta}^{\#1}$	$f_{2+\alpha\beta}^{\#1}$	$\omega_{2}^{\#1}{}_{\alpha\beta\chi}$
$\omega_{2}^{\sharp 1} \dagger^{lpha eta}$	$-\frac{3k^2r_3}{2}$	0	0
$f_{2}^{#1} \dagger^{\alpha\beta}$	0	0	0
$\omega_2^{#1} \dagger^{\alpha\beta\chi}$	0	0	0

$\sigma_{2}^{\#1}$ $\sigma_{2}^{\#1}$ $\sigma_{2}^{\#1}$ $\sigma_{2}^{\#1}$	0	0	0
$\tau_{2}^{\#1}_{\alpha\beta}$	0	0	0
$\sigma_{2^+}^{\#1}{}_{\alpha\beta}$	$-\frac{2}{3 k^2 r_3}$	0	0
	$\sigma_{2}^{\#1} + ^{lphaeta}$	$\tau_2^{\#1} + ^{\alpha\beta}$	$\sigma_{2}^{\#1} +^{lphaeta\chi}$

$O_2 + \alpha \beta C_2 + \alpha \beta O_2 - \alpha \beta \chi$	0	0	0	
$^{\prime}2^{+}\alpha\beta$	0	0	0	
$\sigma_{2}^{+}\alpha\beta$	$-\frac{2}{3k^2r_3}$	0	0	
	$\sigma_{2}^{\#1} + ^{\alpha\beta}$	$\tau_{2}^{\#1} + \alpha \beta$	$\sigma_{2}^{\#1} +^{lphaeta\chi}$	

Unitarity conditions
$r_2 < 0 \& k r_3 < 0 \& k r_5 < -\frac{r_3}{2} \& k t_2 > 0 \parallel r_2 < 0 \& k r_3 < 0 \& k r_5 > -2 r_3 \& k t_2 > 0 \parallel$
$r_2 < 0 \&\& r_3 > 0 \&\& -2 r_3 < r_5 < -\frac{r_3}{2} \&\& t_2 > 0$

Massive particle

Pole residue: