## **PSALTer results panel**

 $I_{\alpha_{\chi}\ eta}\ \mathcal{A}^{lphaeta\chi}$  +24  $\lambda$   $\mathcal{A}^{lphaeta}_{lpha}\ \mathcal{A}^{\chi}_{eta\chi}$  -  $\nu$   $\mathcal{A}^{lpha}$ 

 $\lambda \mathcal{A}_{\beta x}^{x} \partial^{\beta} f^{\alpha}_{\alpha} - 2 v \mathcal{A}_{\beta x}^{x} \partial^{\beta} f^{\alpha}_{\alpha} +$ 

## Wave operator and propagator

	•		•					
	$\overset{1^{+}}{\cdot}\mathscr{H}^{\parallel}{}_{\alpha\beta}$	$^{1^{+}}\mathcal{H}^{^{\perp}}{}_{\alpha\beta}$	$1^+f^{\parallel}_{\alpha\beta}$	$^1\mathcal{B}_{a}$	$^{1}\mathcal{A}^{\parallel}_{lpha}$	$^{1}\mathcal{A}_{a}^{\scriptscriptstyle \perp}$	$^{1}f^{\parallel}_{\alpha}$	$^1f^{^{\perp}}{}_{\alpha}$
$^{1^{+}}\mathcal{F}^{\parallel}$ $^{+}$	$\frac{1}{6} \left( -6 \lambda. + 6 k^2 \left( 2 r. + r. \right) + t. + 4 t. \right)$	$-\frac{6 \lambda + t_1 - 2 t_1}{3 \sqrt{2}}$	$-\frac{i \ k(6 \ \lambda . + t_1 - 2 \ t_1)}{3 \ \sqrt{2}}$	0	0	0 0		0
$^{1^{+}}_{\cdot}\mathcal{H}^{\scriptscriptstyle \perp}$ $^{lphaeta}$	$-\frac{6 \lambda + t_1 - 2 t_2}{3 \sqrt{2}}$	$\frac{t.+t.}{\frac{1}{3}}$	$\frac{1}{3} i k(t_1 + t_1)$	0	0	0 0		0
$^{1^{+}}f^{\parallel}$ † $^{\alpha\beta}$	$\frac{i \ k(6 \ \lambda. + t_{\star} - 2 \ t_{\star})}{3 \ \sqrt{2}}$	$-\frac{1}{3}i k(t_1 + t_2)$	$\frac{1}{3}k^2(t_1+t_2)$	0	0	0 0		0
$^{1}\mathcal{B}\dagger^{^{lpha}}$	0	0	þ	0	0	0 0		0
$^{1}\mathcal{A}^{\parallel}\dagger^{\alpha}$	0	0	D .	0	$\frac{1}{18} \left( -6 \lambda. + v. + 3 t_1 + 2 k^2 \left( 9 \left( r_1 + r_2 + r_3 \right) + 2 \xi. \right) \right)$	$\frac{24 \lambda - v + 6 t_1 - 4 k^2 \xi}{18 \sqrt{2}}$	0	$-\frac{1}{18} i \ k(-24 \lambda. + v6 t. +4 k^2 \xi.)$
$^{1}\mathcal{R}^{\scriptscriptstyle \perp}\dagger^{\scriptscriptstyle lpha}$	0	0	D	0	$\frac{24 \lambda - v + 6 t - 4 k^2 \xi}{18 \sqrt{2}}$	$\frac{1}{36} (12 \lambda + v + 12 t + 4 k^2 \xi)$	0	$\frac{i  k(12  \lambda + v + 12  t_1 + 4  k^2  \xi_1)}{18  \sqrt{2}}$
$^{1}f^{\parallel}\dagger^{\alpha}$	0	0	þ	0	0	0 0		0
$^{1}f^{\scriptscriptstyle \perp}\dagger^{\scriptscriptstyle lpha}$	0	0	þ	0	$\frac{1}{18} i \ k(-24 \lambda. + v6 t. +4 k^2 \xi.)$	$-\frac{i \ k(12 \ \lambda. + v. + 12 \ t_1 + 4 \ k^2 \ \xi.)}{18 \ \sqrt{2}}$	0	$\frac{1}{18} k^2 (12 \lambda_1 + v_1 + 12 t_1 + 4 k^2 \xi_1)$
	_							

_	$\overset{1^{+}}{\cdot}\mathcal{H}^{\parallel}{}_{\alpha\beta}$	$^{1,^{+}}\mathcal{A}^{\perp}{}_{lphaeta}$	$^{1^{+}}f^{\parallel}_{\alpha\beta}$	$^1\mathcal{B}_{\alpha}$	$^{1}\mathcal{A}^{\parallel}{}_{lpha}$	$^{1}$ $\mathscr{R}^{^{\perp}}{}_{lpha}$	$^{1}f^{\parallel}_{\alpha}$	$^{1}f^{\perp}{}_{\alpha}$
$\overset{1^{+}}{\cdot}\mathscr{R}^{\parallel}\dagger^{\alpha\beta}$	$\frac{1}{6} \left( -6 \lambda. + 6 k^2 \left( 2 r. + r. \right) + t. + 4 t. \right)$	$-\frac{6\lambda + t \cdot 2t}{3\sqrt{2}}$	$-\frac{i \ k(6 \ \lambda \ +t_1 - 2 \ t_1)}{3 \ \sqrt{2}}$	0	0	0 0		0
$^{1^{+}}\mathcal{H}^{\scriptscriptstyle{\perp}}\dagger^{^{lphaeta}}$	$-\frac{6\lambda + t \cdot -2t \cdot }{3\sqrt{2}}$	$\frac{t_1+t_2}{\frac{1}{3}}$	$\frac{1}{3} i k(t_1 + t_1)$	0	0	0 0		0
$1^+f^{\parallel} \uparrow^{\alpha\beta}$	$\frac{i \ k(6 \ \lambda. + t 2 \ t.)}{3 \ \sqrt{2}}$	$-\frac{1}{3} i k(t_1 + t_1)$	$\frac{1}{3}k^2(t_1+t_2)$	0	0	0 0		0
$^{1}\mathcal{B}\dagger^{\alpha}$	0	0	0	0	0	0 0		0
$^{1}\mathcal{A}^{\parallel}\dagger^{lpha}$	0	0	0	0	$\frac{1}{18} \left( -6 \lambda. + v. + 3 t_1 + 2 k^2 \left( 9 \left( r_1 + r_2 + r_3 \right) + 2 \xi. \right) \right)$	$\frac{24 \lambda - \nu + 6 t_1 - 4 k^2 \xi}{18 \sqrt{2}}$	0	$-\frac{1}{18}i \ k(-24 \lambda. + v6 t. +4 k^2 \xi.)$
$^{1}\mathcal{A}^{\scriptscriptstyle \perp}\dagger^{\scriptscriptstyle lpha}$	0	0	0	0	$\frac{24 \lambda \cdot v + 6 t_1 - 4 k^2 \xi}{18 \sqrt{2}}$	$\frac{1}{36}$ (12 $\lambda$ . + $v$ . +12 $t$ <sub>1</sub> +4 $k$ <sup>2</sup> $\xi$ .)	0	$\frac{i \ k(12 \ \lambda. + v. + 12 \ t. + 4 \ k^2 \ \xi.)}{18 \ \sqrt{2}}$
$^{1}f^{\parallel}\dagger^{\alpha}$	0	0	0	0	0	0 0		0
$^{1}f^{\scriptscriptstyle \perp}\dagger^{\scriptscriptstyle lpha}$	0	0	0	0	$\frac{1}{18} i \ k(-24 \lambda. + v6 t. +4 k^2 \xi.)$	$-\frac{i  k(12  \lambda + \nu + 12  t_1 + 4  k^2  \xi)}{18  \sqrt{2}}$	0	$\frac{1}{18} k^2 (12 \lambda_1 + v_1 + 12 t_1 + 4 k^2 \xi_1)$
ع ع			_					

0					0		0			0		
0					0		0			0		
0					0		0			0		
$2 k^{2} (9(r_{1} + r_{4} + r_{5}) + 2 \xi.))$				(.))	24 λv.+6 18 γ	t -4 k	ξ.		0	$-\frac{1}{18}i \ k(-24 \lambda. + v6 t. +4 k^2 \xi.)$		
$v + 6t - 4k^2 \xi$ . 18 $\sqrt{2}$				1/36 (12.	$\frac{1}{36} (12 \lambda. + v. + 12 t. + 4 k^2 \xi.)$			ξ.)	0	$\frac{i \ k(12 \ \lambda + v + 12 \ t + 4 \ k^2 \ \xi)}{18 \ \sqrt{2}}$		
0					0 0					0		
$+ v6 t_1 +4 k^2 \xi.$				_ i k	$\frac{i \ k(12 \lambda + v + 12 t_1 + 4 k^2 \xi)}{18 \sqrt{2}}$				0	$\frac{1}{18} k^2 (12 \lambda. + v. + 12 t. + 4 k^2 \xi.)$		
t L							Ft. 2					
y @ x	0 0	0	0	0	0	0	$\frac{1}{2\lambda + k^2 r_2 + t_2}$					
0 +1 +0				0	0		0					
A 4 2 4 2 4 2 4 4 4 4 4 4 4 4 4 4 4 4 4	ll, T, C	0 0	$\frac{+24 k^{2} (r_{1} - r_{3} + 2 r_{4}))}{v_{1} + 2 k^{2} v_{1} (r_{1} - r_{3} + 2 r_{4}))}$	$k^{\frac{3}{2}} \frac{f}{(t-r,+2r,)} + \frac{1}{1-3} \frac{3}{4})$	$\frac{14 k^{2} (r_{1} r_{3} + 2 r_{4})}{1 \cdot 3 \cdot 4 \cdot 2 \cdot 2 \cdot (r_{1} r_{3} + 2 r_{4})}$	0 0	0					

						Multip	1	1	П	е	е	3	3	
					1:0									
O	0	0	0	0	$\begin{array}{c c} 0 & -2\lambda + k^2 r_2 + t_2 \end{array}$								$+2 \partial_{\delta} \partial^{\delta} \partial_{\chi} \sigma^{\chi \alpha \beta} =$	
0	0	0	0	0	0					×			σ <sup>χ</sup> βδ.	0,0
	k² ν. 2 √3	i κ(12λ.ν.) 6 √2	k² v.							$_5\partial^\delta\partial_\chi\partial_eta\sigma^{etalpha}$			$+2 \frac{\partial_{\delta}\partial_{\chi}\partial^{a}}{\partial_{\alpha}}$	$+$ 2 $\sigma_{\delta}\sigma_{\chi}$
0 0	<i>i k</i> (12 λν.) 2 √6	$-\lambda + \frac{v}{12} + 2 k^2 (r_1 - r_3 + 2 r_4)$	<i>i k</i> (12 λ − ν.) 6 √2	0 0	0 0	Spin-parity form Covariant form	$\partial_\beta\partial_\alpha t^{\alpha\beta} == 0$	$\partial_{\alpha}\partial^{\alpha}\rho + \partial_{\beta}\partial^{\beta}t^{\alpha}_{\alpha} == \partial_{\beta}\partial_{\alpha}t^{\alpha\beta}$	$\partial_{\alpha} \mathcal{J}^{\alpha} == 0$	$2ik_1^{}\sigma^{\iota}{}^{\alpha} + i^{}{}_{}{}^{\mu}{}^{\alpha} = 0  \left  \partial_{\chi}\partial_{\beta}\partial^{\alpha}\tau^{\beta\chi} = \partial_{\zeta}\partial^{\chi}\partial_{\beta}\tau^{\alpha\beta} + 2\partial_{\delta}\partial^{\delta}\partial_{\chi}\partial_{\beta}\sigma^{\beta\alpha\chi} \right $	$\partial_{\chi}\partial_{\beta}\partial^{\alpha}\tau^{\beta\chi} == \ \partial_{\zeta}\partial^{\chi}\partial_{\beta}\tau^{\beta\alpha}$	$\partial_{\beta}\partial^{\alpha}\mathcal{J}^{\beta} == \partial_{\beta}\partial^{\beta}\mathcal{J}^{\alpha}$	$i \ k^{1+} \sigma^{\iota \alpha \beta} + 1^{\iota} t^{\iota \alpha \beta} = 0 \ \frac{\partial_{\lambda} \partial^{\alpha} t^{\beta \gamma} + \partial_{\lambda} \partial^{\beta} t^{\gamma \alpha} + \partial_{\lambda} \partial^{\gamma} t^{\alpha \beta} + 2 \ \partial_{\alpha} \partial_{\lambda} \partial^{\alpha} \sigma^{\chi} \ \delta^{\beta} + 2 \ \partial_{\alpha} \partial^{\beta} \partial_{\chi} \sigma^{\chi \alpha \beta} = 0 \ \delta^{\alpha} \delta$	$\partial_{x}\partial^{\alpha} r^{\alpha} + \partial_{x}\partial^{\alpha} r^{\alpha} + \partial_{x}\partial^{\alpha} r^{\alpha} + 2 \partial_{\delta}\partial_{x}\partial^{\alpha}\partial^{\alpha} r^{\alpha}$
O	$\frac{k^2 v}{2}$	i k(12λ · v.) 2 √6	$\frac{k^2 v}{2 \sqrt{3}}$	0	0	y form Co		0 ==		$+ 1 t^{\alpha} = 0$			$+ 1^{+} t^{\parallel}^{\alpha \beta} == 0$	
٥	0	0	0	0	0	parit	0 =	∥ <sup>1</sup> +0	0::	$\sigma^{T\alpha}$	0 ==	== 0	J. als	
. 8t 0 0	1φ <sub>+0</sub>	# # +	)+ <i>f</i>    +	‡-,f+		Spin-	0 == -1 -0	$0 = \  \iota_{+0} + \sigma_{+0} \ $	0== £ :0	2 i k1	$_{1}\ _{\tau ^{\parallel \alpha }}==0$	$^{1}\mathcal{J}^{\alpha}=0$	i k1+	

# S	:: [[[[(	== $\iiint \left(\frac{1}{1} \left(\frac{1}{2} \left(18 \phi \right) + 18 \right) \sigma^{\alpha \beta \chi} \right)$	-18 σ <sup>αβχ</sup> . Æ. , +36	K. 4	$A^{\alpha\beta\chi} + e^t$	85	. 9 <sup>αβχ</sup> -12 t9	9 +36 A. 9 . 9 *** +6 t. 9 . 9 *** -12 t. 9 . 9 *** +24 A. 9 *** 9 **	<u>k</u>	×.
7			$\mathcal{A}_{\beta_X}^{x} + 6t$ . $\mathcal{A}^{\alpha\beta}_{\alpha}$	β	$+18 t^{\alpha\beta} f_{\alpha\beta} + 18 \mathcal{J}^{\alpha}$	$\frac{1}{\alpha \beta} + \frac{\alpha \chi}{1}$	$g \int_{\alpha}^{\beta} g_{\alpha} + 6 v$	$S_{\alpha} + 6 \text{ V. } \mathcal{A}_{\alpha\beta}^{\beta} \partial^{\alpha} \phi + 9 \text{ V. } \partial_{\alpha} \phi \partial^{\beta} \phi$	$\partial_{\alpha}\phi$	α σ. β × βΦ-
			$6  \nu  \partial_{\alpha} f^{\beta}_{\beta} \partial^{\alpha} \phi + 36  \lambda  f^{\alpha \beta}_{\beta} \partial_{\alpha} \chi^{\chi}_{\alpha} - 36  \lambda  \partial_{\beta} \mathcal{A}^{\alpha \beta}_{\alpha} - 72  \lambda  \phi  \partial_{\beta} \mathcal{A}^{\alpha \beta}_{\alpha} + 6  \nu  \partial^{\alpha} \phi$ $12  \lambda   \mathcal{A}_{\alpha \chi}^{\chi}  \partial_{\beta} f^{\alpha \beta} + 2  \nu   \mathcal{A}_{\alpha \chi}^{\chi}  \partial_{\beta} f^{\alpha \beta}_{\alpha} - 12  t_{\perp}^{\prime}  \mathcal{A}_{\alpha \chi}^{\chi}  \partial_{\beta} f^{\alpha \beta}_{\alpha} + 12  \lambda   \mathcal{A}_{\beta \chi}^{\chi}  \partial^{\beta} f^{\alpha}_{\alpha}$	$\int_{\beta}^{\beta} \partial^{\alpha} \phi + 36 \lambda \int_{\alpha} \int_{\beta}^{\alpha\beta} \partial_{\beta} A_{\alpha}^{\alpha\chi} - 36 \lambda \partial_{\beta} A^{\alpha\beta}$ $\int_{\alpha}^{\alpha} \partial_{\beta} f^{\alpha\beta} + 2 \lambda \int_{\alpha}^{\alpha} A_{\alpha}^{\chi} \partial_{\beta} f^{\alpha\beta} - 12 t \int_{\beta}^{\alpha} A_{\alpha}^{\chi}$	${}_{s}\mathcal{A}_{a}{}_{x}^{x}$ -36 ${}_{x}^{x}$ $\partial_{\beta}f^{a\beta}$ -	$\lambda \lambda \partial_{\beta} S$	$q^{\alpha\beta}_{\alpha}$ -72 $\lambda$ $\phi$ $\beta \mathcal{A}^{\alpha\beta}_{\beta}$ $\mathcal{A}_{\alpha}^{X}$ $\partial_{\beta} f^{\alpha\beta}$ +12 $\lambda$ .	$A^{\alpha\beta}_{\alpha} + 6 \ \nu \partial^{\alpha} \phi \partial_{\beta} f^{\beta}_{\alpha} - \lambda \mathcal{A}^{x} \partial^{\beta} f^{\alpha}_{\alpha} - 2 \nu \mathcal{S}$	$b  \partial_t f_{\alpha}^{\ \beta} = 2  v  \mathcal{A}_{\beta  x}^{\ x}$	$A_{\beta,\chi}^{\chi} \partial^{\beta} f^{\alpha}$
			$12t_1 \mathcal{A}_{\chi}^{X} \partial^{\beta} f_{\alpha}^{a} - 6 \lambda \partial_{\beta} f_{\chi}^{X} \partial^{\beta} f_{\alpha}^{a} + V \partial_{\beta} f_{\chi}^{X} \partial^{\beta} f_{\alpha}^{a} - 6 t_1 \partial_{\beta} f_{\chi}^{X} \partial^{\beta} f_{\alpha}^{a} - 36 \lambda f^{\alpha\beta} \partial_{\chi} \mathcal{A}_{\alpha\beta}^{X} + 8 \partial_{\alpha} \partial^{\chi} f^{\alpha\beta} \partial_{\alpha} \mathcal{A}_{\alpha\beta}^{A} \partial_{\beta} f^{\alpha\beta} \partial_{\alpha} f^{\alpha\beta$	$-6 \lambda \partial_{\beta} f^{\chi}$ $^{\delta} + 36 \lambda$	$\int_{X}^{1} \partial^{\beta} f^{\alpha}_{\alpha} + V \partial_{\beta} f^{\chi}_{\chi} \partial^{\beta} f^{\alpha}_{\alpha}$ $f^{\alpha} \partial_{\alpha} \mathcal{A}^{\beta \chi} - 6 \lambda \partial_{\alpha} f^{\alpha \beta}$	$V \partial_{\beta} f^{\chi}$	$\partial^{\beta} f^{\alpha} - 6 t \partial_{\beta} f^{\chi} \partial^{\beta} f^{\alpha}$ $\partial_{\alpha} f^{\alpha \beta} \partial_{\alpha} f^{\chi} + V \partial_{\alpha} f^{\alpha \beta} \partial_{\alpha} f^{\alpha \beta}$	$\sum_{x} \partial^{\beta} f_{\alpha}^{\alpha} - 36 \lambda \int^{\alpha \beta} \partial_{x} \mathcal{A}_{\alpha\beta}^{x} + \frac{1}{2} \partial_{\alpha} f^{\alpha\beta} \partial$	$a^{x\beta} \partial_{x} c$	A x + β λ + β θ f x +
			$12\lambda \partial^{\beta} f_{\alpha}^{a} \partial_{\lambda} f_{\beta}^{x} - 2 u \partial^{\beta} f_{\alpha}^{a} \partial_{\lambda} f_{\beta}^{x} + 12 t \int_{1}^{1} \partial^{\beta} f_{\alpha}^{a} \partial_{\lambda} f_{\beta}^{x} - 18 t \int_{1}^{1} \partial^{\beta} \mathcal{H}_{\chi}^{\delta} \partial^{\beta} \mathcal{H}^{\alpha\beta}$	$2 \vee \partial^{\beta} f^{\alpha}$	$\partial_{\chi} f_{\beta}^{\chi} + 1$	$^{\beta}$ 2 $t$ . $\partial^{\beta}$	$f^{\alpha}_{\alpha}\partial_{\chi}f^{\chi}_{\beta}$ -18 $f^{4}$	$\partial_{\beta}\mathcal{A}_{\chi\delta}^{\delta}\partial^{\chi}\mathcal{A}^{\alpha\beta}$ +		σ. <sub>×</sub>
			$18r$ , $\partial_{eta} \mathcal{A}_{\chi  \delta}^{\ \ \delta} \partial^{\chi} \mathcal{A}^{lpha eta}$	αβ +4 ξ ô	8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	₹ <sup>αβ</sup> -1	$8 r_4 \partial_{\chi} \mathcal{A}_{\beta \delta}^{\delta} \partial^{\chi} \mathcal{S}_{\delta}$	$\stackrel{\circ}{_{\scriptstyle a}} + 4 \stackrel{\varepsilon}{_{\scriptstyle c}} \partial_{\mu} \mathcal{A}_{\stackrel{\circ}{_{\scriptstyle b}}} \partial^{\nu} \mathcal{A}^{a_{\scriptscriptstyle b}} \partial_{\lambda} \mathcal{A}_{\stackrel{\circ}{_{\scriptstyle b}}} \partial^{\nu} \mathcal{A}^{a_{\scriptscriptstyle b}} \partial^{\nu} \mathcal{A}^{a_{\scriptscriptstyle b}}$	e ox s	(α <sub>β</sub> -
			$4 \xi \partial_{\chi} \mathcal{A}_{\rho} \partial^{\zeta} \partial^{\zeta} \mathcal{A}_{\mu} = 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu} + 24 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu} - 12 t \mathcal{A}_{\alpha \gamma \rho} \partial^{\zeta} f^{\mu \nu} + 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu} + 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu} + 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu} + 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu} + 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu} + 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu} + 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu} + 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu} + 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu} + 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu} + 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu} + 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu} + 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu} + 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu} + 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu} + 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu} + 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu} + 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu} + 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu} + 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu} + 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu} + 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu} + 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu} + 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu} + 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu} + 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu} + 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu} + 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu} + 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu} + 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu} + 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu} + 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu} + 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu} + 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu} + 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu} + 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu} + 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu} + 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu} + 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu} + 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu} + 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\nu \nu} + 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu} + 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu} + 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu} + 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu} + 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu} + 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu} + 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu} + 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu} + 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu} + 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu} + 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu} + 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu} + 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu} + 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu} + 12 t \mathcal{A}_{\gamma \gamma \rho} \partial^{\zeta} f^{\mu \nu$	" +36 λ ; +12 t	$\mathcal{A}_{\alpha_X}{}_{\beta}\partial^x f$	# +24 -18 ›	$t_1 \mathcal{A}_{\alpha_X \beta} \partial^X f^{up} - \frac{1}{2}$	$12 \frac{t}{t}$ , $\mathcal{A}_{\alpha_X \beta} \partial^x f^{\omega}$	+ +	to 3χ€ s
			$\frac{12L_1}{3} \frac{J g_{g\alpha}}{g^{\lambda} f^{\alpha \beta}} = \frac{1}{12} \frac{1}{L_1} \frac{J g_{g\alpha}}{g^{\lambda} f^{\alpha \beta}} = \frac{1}{3} \frac{1}{L_2} \frac{\partial a_f}{\partial a_f} \frac{g^{\lambda} f^{\alpha \beta}}{g^{\lambda} f^{\alpha \beta}} + 9 \lambda \partial_{\beta} f_{\alpha \chi} \frac{\partial^{\chi} f^{\alpha \beta}}{g^{\lambda} f^{\alpha \beta}} + 6 \frac{1}{L_1} \partial_{\beta} f_{\alpha \chi} \frac{\partial^{\chi} f^{\alpha \beta}}{\partial x^{\gamma} g^{\alpha \beta}} = \frac{1}{2} \frac{1}{L_2} \frac{\partial^{\chi} f^{\alpha \beta}}{\partial x^{\gamma} g^{\alpha \beta}} = \frac{1}{2} \frac{1}{L_1} \frac{\partial^{\chi} f^{\alpha \beta}}{\partial x^{\gamma} g^{\alpha \beta}} + \frac{1}{2} \frac{1}{L_2} \frac{\partial^{\chi} f^{\alpha \beta}}{\partial x^{\gamma} g^{\alpha \beta}} = \frac{1}{2} \frac{1}{L_2} \frac{\partial^{\chi} f^{\alpha \beta}}{\partial x^{\gamma} g^{\alpha \beta}} = \frac{1}{2} \frac{1}{L_2} \frac{\partial^{\chi} f^{\alpha \beta}}{\partial x^{\gamma} g^{\alpha \beta}} = \frac{1}{2} \frac{1}{L_2} \frac{\partial^{\chi} f^{\alpha \beta}}{\partial x^{\gamma} g^{\alpha \beta}} = \frac{1}{2} \frac{1}{L_2} \frac{\partial^{\chi} f^{\alpha \beta}}{\partial x^{\gamma} g^{\alpha \beta}} = \frac{1}{2} \frac{1}{L_2} \frac{\partial^{\chi} f^{\alpha \beta}}{\partial x^{\gamma} g^{\alpha \beta}} = \frac{1}{2} \frac{1}{L_2} \frac{\partial^{\chi} f^{\alpha \beta}}{\partial x^{\gamma} g^{\alpha \beta}} = \frac{1}{2} \frac{1}{L_2} \frac{\partial^{\chi} f^{\alpha \beta}}{\partial x^{\gamma} g^{\alpha \beta}} = \frac{1}{2} \frac{1}{L_2} \frac{\partial^{\chi} f^{\alpha \beta}}{\partial x^{\gamma} g^{\alpha \beta}} = \frac{1}{2} \frac{1}{L_2} \frac{\partial^{\chi} f^{\alpha \beta}}{\partial x^{\gamma} g^{\alpha \beta}} = \frac{1}{2} \frac{1}{L_2} \frac{\partial^{\chi} f^{\alpha \beta}}{\partial x^{\gamma} g^{\alpha \beta}} = \frac{1}{2} \frac{1}{L_2} \frac{\partial^{\chi} f^{\alpha \beta}}{\partial x^{\gamma} g^{\alpha \beta}} = \frac{1}{2} \frac{1}{L_2} \frac{\partial^{\chi} f^{\alpha \beta}}{\partial x^{\gamma} g^{\alpha \beta}} = \frac{1}{2} \frac{1}{L_2} \frac{\partial^{\chi} f^{\alpha \beta}}{\partial x^{\gamma} g^{\alpha \beta}} = \frac{1}{2} \frac{1}{L_2} \frac{\partial^{\chi} f^{\alpha \beta}}{\partial x^{\gamma} g^{\alpha \beta}} = \frac{1}{2} \frac{1}{L_2} \frac{\partial^{\chi} f^{\alpha \beta}}{\partial x^{\gamma} g^{\alpha \beta}} = \frac{1}{2} \frac{1}{L_2} \frac{\partial^{\chi} f^{\alpha \beta}}{\partial x^{\gamma} g^{\alpha \beta}} = \frac{1}{2} \frac{1}{L_2} \frac{\partial^{\chi} f^{\alpha \beta}}{\partial x^{\gamma} g^{\alpha \beta}} = \frac{1}{2} \frac{1}{L_2} \frac{\partial^{\chi} f^{\alpha \beta}}{\partial x^{\gamma} g^{\alpha \beta}} = \frac{1}{2} \frac{1}{L_2} \frac{\partial^{\chi} f^{\alpha \beta}}{\partial x^{\gamma} g^{\alpha \beta}} = \frac{1}{2} \frac{1}{L_2} \frac{\partial^{\chi} f^{\alpha \beta}}{\partial x^{\gamma} g^{\alpha \beta}} = \frac{1}{2} \frac{1}{L_2} \frac{\partial^{\chi} f^{\alpha \beta}}{\partial x^{\gamma} g^{\alpha \beta}} = \frac{1}{2} \frac{1}{L_2} \frac{\partial^{\chi} f^{\alpha \beta}}{\partial x^{\gamma} g^{\alpha \beta}} = \frac{1}{2} \frac{1}{L_2} \frac{\partial^{\chi} f^{\alpha \beta}}{\partial x^{\gamma} g^{\alpha \beta}} = \frac{1}{2} \frac{\partial^{\chi} f$	$\tau$ 12 $t$ , $\partial_{\alpha} f_{\chi}$ ,	$\beta \chi \alpha \stackrel{O.f}{=} 3 i$	$f_{2} \partial_{\alpha} f_{\chi}$	$\partial_{\alpha} f_{\beta \chi} U V = 12$ $\partial^{\chi} f^{\alpha \beta} + 9 \lambda \partial_{\beta J}$	$\int_{-1}^{1} \int_{0}^{a} \int_{BX}^{A} \int_{0}^{A} \int_$	$f_{\alpha\chi}^{1}$	x βx σ . ) x f αβ =
			$3t, \partial_{\beta}f_{\alpha\chi} \partial^{\chi}f^{\alpha\beta} + 9 \lambda \partial_{\chi}f_{\alpha\beta} \partial^{\chi}f^{\alpha\beta} + 12 t, \partial_{\chi}f_{\alpha\beta} \partial^{\chi}f^{\alpha\beta} + 3 t, \partial_{\chi}f_{\alpha\beta} \partial^{\chi}f^{\alpha\beta} + 9 \lambda \partial_{\chi}f_{\beta\alpha} \partial^{\chi}f^{\alpha\beta} + 3 t, \partial_{\chi}f_{\alpha\beta} \partial^{\chi}f^{\alpha\beta} + 3 t, \partial_{\chi}f_{\alpha\beta} \partial^{\chi}f^{\alpha\beta} \partial^{\chi}f^$	$^{-}$ 9 $^{\lambda}$ $\partial_{\chi}f_{\alpha\beta}$	$\partial^{\chi} f^{\alpha\beta} + 1$	$\begin{bmatrix} 1 \\ 2 \end{bmatrix}_{t_1} \partial_{x_1}$	$f_{\alpha\beta}  \partial^{\chi} f^{\alpha\beta} + 3  t$	$\partial_{\chi} f_{\alpha\beta}  \partial^{\chi} f^{\alpha\beta} + 9  \lambda$	$\partial_\chi f_{eta}$	$+ g_X f_{\alpha\beta} +$
			$6_{1}^{-}\partial_{\chi}f_{\rho\alpha}\partial^{\chi}f^{\alpha\beta} - 3_{2}^{-}\partial_{\chi}f_{\rho\alpha}\partial^{\chi}f^{\alpha\beta} + 6(t_{1}^{-}+t_{2}^{-})\mathcal{F}_{\alpha\beta\chi}\left(\mathcal{F}^{\alpha\beta\chi} + 2_{2}\partial^{\chi}f^{\alpha\beta}\right) - 8_{2}^{-}\partial_{\alpha}\mathcal{F}_{\alpha\beta}^{-}\partial_{\beta}f^{\alpha\beta} - 6_{2}^{-}\partial_{\alpha}\mathcal{F}_{\alpha\beta}^{-}\partial_{\beta}f^{\alpha\beta} - 6_{2}^{-}\partial_{\alpha}\mathcal{F}_{\alpha\beta}^{-}\partial_{\beta}\mathcal{F}_{\alpha\beta}^{-$	$3t, \partial_{\chi}f_{\beta\alpha}\partial_{\alpha}$	$f_X f^{\alpha\beta} + 6$	t + t	) A <sub>abx</sub> (A <sup>abx</sup> +	-2 $\partial^{\chi}f^{\alpha\beta}$ )-8 $\xi$ $\partial_{\alpha}$	& ×	$\partial^X \partial_\beta f^{\alpha\beta}$ -
			$18r_1\partial_\alpha \mathcal{A}^{\alpha\beta\ell}\partial_\delta \mathcal{A}^{\delta} - 18r_1\partial_\alpha \mathcal{A}^{\alpha\beta\ell}\partial_\delta \mathcal{A}^{\delta} + 36r_1\partial^{\delta} \mathcal{A}^{\alpha\beta}$ $4 \partial_\alpha \mathcal{A}^{\alpha\beta\ell}\partial_\delta \mathcal{A}^{\delta} - 18r_1\partial_\alpha \mathcal{A}^{\alpha\beta\ell}\partial_\delta \mathcal{A}^{\delta} + 36r_1\partial^{\delta} \mathcal{A}^{\alpha\beta}$ $10r_2\partial_\alpha \partial_\delta \mathcal{A}^{\delta} = 0$ $10r_2\partial_\alpha \partial_\delta \mathcal{A}^{\delta} = 0$ $10r_2\partial_\alpha \partial_\delta \mathcal{A}^{\delta} = 0$	$\frac{\delta}{\beta \chi}$ -18 $r_{\rm s}$	3 A abx 3	£ 5	.36 <i>r</i> , ∂ <sup>x</sup> 𝕊 <sup>αβ</sup> , ∂ <sub>c</sub>	$S_{\mathcal{A}_{\beta,\chi}^{\delta}} + 36 r, \partial^{\chi} g$	ηαβ () ηαβ ()	<sup>2</sup> 3οβ <sup>6</sup> - 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3
			161 4 6,0 3	xβ T10'5 δ+4ξθ	$\partial^{x}f^{\alpha\beta}\partial_{\kappa}\partial$	6πχβ <sub>v</sub> f <sup>6</sup> -2	47.08.20.00.00.00.00.00.00.00.00.00.00.00.00.	$(\alpha_{X}^{\mu})^{-3}$ $(\alpha_{X}^{\mu})^{-3}$ $(\alpha_{X}^{\mu})^{-3}$ $(\alpha_{X}^{\mu})^{-3}$	2°62	$\alpha^{U_{\delta}\mathcal{M}_{X\beta}}$ = $\partial^{\delta}\mathcal{A}^{\alpha\beta\chi}$ +
			$12r_1 \frac{\partial_{\beta}\mathcal{A}_{\alpha \delta \chi}}{\partial_{\beta}\mathcal{A}_{\alpha \delta \chi}} \frac{\partial^{\delta}\mathcal{A}^{\alpha \delta \chi}}{\partial_{\gamma}\mathcal{A}_{\alpha \delta \delta}} \frac{\partial^{\delta}\mathcal{A}^{\alpha \delta \chi}}{\partial^{\delta}\mathcal{A}^{\alpha \delta \chi}} + 24r_1 \frac{\partial_{\beta}\mathcal{A}_{\chi}}{\partial_{\delta}\mathcal{A}_{\chi}} \frac{\partial^{\delta}\mathcal{A}_{\alpha \delta \delta}}{\partial^{\delta}\mathcal{A}^{\alpha \delta \chi}} - 5r_2 \frac{\partial_{\gamma}\mathcal{A}_{\alpha \delta \delta}}{\partial_{\gamma}\mathcal{A}_{\alpha \delta \delta}} \frac{\partial^{\delta}\mathcal{A}^{\alpha \delta \chi}}{\partial^{\delta}\mathcal{A}^{\alpha \delta \chi}} + 12r_1 \frac{\partial_{\delta}\mathcal{A}_{\alpha \delta \chi}}{\partial^{\delta}\mathcal{A}^{\alpha \delta \chi}} + \frac{\partial_{\delta}\mathcal{A}_{\alpha \delta \chi}}{\partial^{\delta}\mathcal{A}^{\alpha \delta \chi}} \frac{\partial^{\delta}\mathcal{A}^{\alpha \delta \chi}}{\partial^{\delta}\mathcal{A}^{\alpha \delta \chi}} + \frac{\partial_{\delta}\mathcal{A}_{\alpha \delta \chi}}{\partial^{\delta}\mathcal{A}^{\alpha \delta \chi}} \frac{\partial^{\delta}\mathcal{A}_{\alpha \delta \chi}}{\partial^{\delta}\mathcal{A}^{\alpha \delta \chi}} \frac{\partial^{\delta}\mathcal{A}_{\alpha \delta \chi}}{\partial^{\delta}\mathcal{A}^{\alpha \delta \chi}} + \frac{\partial_{\delta}\mathcal{A}_{\alpha \delta \chi}}{\partial^{\delta}\mathcal{A}^{\alpha \delta \chi}} \frac{\partial_{\delta}\mathcal{A}_{\alpha \delta $	abx - 12 r, a $abx - 12 r, a$	$\partial_{\beta}\mathcal{A}_{\alpha\delta\chi}\partial^{\delta}_{\gamma}$	S alix +	-24 r, ∂β9, β <sub>x</sub> ὁα ∂ <sup>δ</sup> 6 r, ∂χ9, αβο ∂ <sup>δ</sup> 9	${}^{\circ}\mathcal{A}^{\alpha\beta\chi} + 12 r_{2} \partial_{\beta}\mathcal{A}_{\beta}$	4 <sub>χ δα</sub> δ <sup>3χ</sup> Θ <sup>δ</sup> S	б <i>Я<sup>авх</sup> -</i> 1 <sup>авх</sup> +
			$6r_2^{}, \partial_{\sigma} \mathcal{R}_{a eta \chi}  \partial^{\sigma} \mathcal{R}^{a eta \chi} + 12  r_1^{}, \partial_{\sigma} \mathcal{R}_{a \chi}  _{eta}^{} \partial^{\sigma} \mathcal{R}^{a eta \chi} - 12  r_2^{}, \partial_{\sigma} \mathcal{R}_{a \chi}  _{eta}^{} \partial^{\sigma} \mathcal{R}^{a eta \chi}) ] [t, x, y, z]  d  z  d  y  d  x$	$^{3\chi}$ +12 $^{r}$ , $^{c}$	$\partial_{\delta}\mathcal{A}_{lpha\chi}\ _{eta}\partial^{\delta}$	χ <sub>αβχ</sub> -:	12 r; дъЯ <sub>ах р</sub> д <sup>5</sup> 5	q <sup>abx</sup> ))[t, x, y, z]c	2 2 0	v Q × D
	$\mathcal{L}_{+0}$		$\sigma_{+0}$		0 <sup>+</sup> 0∥		-0	<sup>1</sup> +0	<sub>1</sub> , 0	⊩ο ο
0+J+	0	0			0			0 0		0
<sup>0</sup> , ρ†	0	3(-12 λ.+ 32 κ² (-12 λ.²	$\frac{3(\cdot12 \ \lambda + \nu + 24 \ k^2 \ (r_1 \cdot r_3 + 2r_4))}{32 \ k^2 \ (\cdot12 \ \lambda^2 + \lambda \ \nu + 2 \ k^2 \ \nu \cdot (r_1 \cdot r_3 + 2r_4))}$	$-4i\sqrt{\frac{2}{3}}k\lambda +$	$+\frac{8 \sqrt{\frac{2}{3}}  k^3  w  (r_1 - r_3 + 2 r_4)}{12  \lambda - v}$	, 3 4	$\sqrt{3}(.12 \ \lambda + \nu + \frac{1}{3})$	$\frac{\sqrt{3}(-12 \ \lambda + \nu + 24 \ k^2 \ (r_1 \ _3 + 2 \ _4))}{32 \ k^2 \ (-12 \ \lambda^2 + \lambda \cdot \nu + 2 \ k^2 \ \nu \ (r_1 \ _3 + 2 \ _4))}$	0	0
0, 0 +	0	4 (- *	$\frac{i\sqrt{\frac{3}{2}}}{4(-k\lambda + \frac{2k^3v\cdot (r_1 + 2k^2)}{12\lambda v\cdot v})}$	-12 \lambda 2 + \lambda \cdot \rangle	v. -12 λ.² + λ. v. + 2 k² v. (rr. + 2 r. )	.+2 <i>r</i> .)	$8\sqrt{2}\left(\frac{k\lambda}{2}+\frac{k\lambda}{2}\right)$	$8 \sqrt{2} \left( \frac{kA}{2} + \frac{k^2 \sqrt{(r_{xy}^2 + 2r_y)}}{12AA+v} \right)$	0	0
‡ <sub> </sub> 1,0	0	$\sqrt{3}(-12 \lambda)$ $32 k^2 (12 \lambda)^2$	$\sqrt{3}(.12 \lambda + v + 24 k^2 (r \cdot r + 2r \cdot ))$ $32 k^2 (.12 \lambda^2 \cdot v \cdot (\lambda + 2 k^2 (r \cdot r + 2r \cdot )))$	8 \(\sqrt{2}\)	$8 \sqrt{2} \left( \frac{k^{\lambda}}{2} + \frac{k^{3} w \left( r_{-} + 42r_{+} \right)}{12^{\lambda} + w} \right)$	27, )	-12 \lambda + \cdot + 24 \\ 32 \kappa^2 \left(-12 \lambda^2 + \lambda \cdot \c	$-12 \lambda + v + 24 k^{2} (r_{13} + 2 r_{4})$ $32 k^{2} (-12 \lambda^{2} + \lambda \cdot v + 2 k^{2} v \cdot (r_{13} + 2 r_{4}))$	0	0
0, 1, 1	0	0			0		)	0 0		0
0 ما +	0	0			0			0	0	$\frac{1}{2\lambda + k^2 r_2 + \frac{1}{2}}$
	$\mathcal{G}_{+0}$	$\phi_{+0}$	$^{0}\mathcal{H}_{\cdot}^{+}$		$\mathbb{I}^{f}_{+0}$	$_{1}f_{_{T}}$	0.78∥			
$^{+}\mathcal{B}_{^{+}0}$	0	0	0	0		0	0			
$\downarrow \phi_{\downarrow 0}$	0	κ <sup>2</sup> ν.	<i>i k</i> (12 λ −v.) 2 √6		$k^2 v$ . $2 \sqrt{3}$	0	0			
0,9⊪+	0	j k(12λ v.) 2 √6	$-\lambda + \frac{v}{12} + 2 k^2 (r_1 - r_3 + r_3)$	-2 7.)	i κ(12 λ - ν ) 6 √2	0	0			
0, f <sub>  </sub> †	0	k² ν 2 √3	i κ(12 λ. ν.) 6 √2		k² v.	0	0			
$\downarrow {}_{\tau} f_{\tau 0}$	0	0	0	0		0	0			

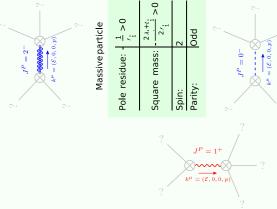
 $\frac{2\lambda + \epsilon}{r_z} > 0$ 

Square mass:

Pole residue:  $\frac{1}{r_i} > 0$ 

Massive particle

## **Massive and massless spectra**



 $\frac{\frac{3(2 \lambda + t_{.})(2 \lambda - t_{.})}{\frac{1}{2(2 r_{.} + r_{.})(t_{.} + t_{.})}} > 0$ 

Massive particle

Even

Pole residue:

Square mass:

Parity:

Sq Sq S	
? $J^{P} = 1^{+}$ $k^{\mu} = \underbrace{(\mathcal{E}, 0, 0, p)}_{?}$ ?	
Massive particle	
$^{2}$ -t, $^{2}$ +4 $\lambda^{2}$ (6 $^{2}$ +3 $^{2}$ +t, +t, +t, +t, +t, +2 $\lambda$ (2 $^{2}$ -t, t, +t, $^{2}$ +4 $^{2}$ -4 $^{2}$ -1, t, -2 $^{2}$ -1	)-4

? ?	
Massive particle	
$\frac{(c_{1}^{2}+c_{1},c_{1}^{2}+4\lambda^{2}(6r_{3}+3r_{5}+t_{1}+t_{2})+2\lambda\cdot(2r_{5}t_{1}+t_{1}^{2}+4r_{5}(t_{1}-2t_{2})+4r_{5}t_{2}+2^{2})+2r_{5}(t_{1}^{2}+2t_{2}^{2}))}{(2r_{3}+r_{5})(t_{1}+t_{2})(12\lambda^{2}+2r_{5}t_{1}+6\lambda\cdot(t_{1}+t_{2})+2r_{5}t_{2}-3t_{1}t_{2}+4r_{3}(t_{1}+t_{2}))}>0$	Pole residu
) > 0	Square ma:
	Spin:

	Massive particle
Poleresidue:	$\frac{\lambda^{.2} + (2r_{.} - 2r_{.3} + r_{.4})t_{.1} + \lambda \cdot (4r_{.1} - 4r_{.3} + 2r_{.4} + t_{.1})}{\lambda \cdot (2r_{.1} - 2r_{.3} + r_{.4})(\lambda \cdot + t_{.1})} > 0$
Square mass:	$\frac{\frac{\lambda \cdot (2\lambda + t_1)}{2(2r_1 - 2r_3 + r_4)(\lambda + t_1)} > 0}{\frac{2(2r_1 - 2r_3 + r_4)(\lambda + t_1)}{2(2r_1 - 2r_3 + r_4)(\lambda + t_1)} > 0$
Spin:	2
Parity:	Even

 $4(v.(r, +r, +r, +r) + 12 \lambda.(r, +r, +r, +\xi) + 6 t.(2r, +2r, +2r, +\xi))^2) + 4 t.$ 

 $4(v(r+r+r)+12\lambda(r+r+r+\xi)+6t(2r+2r+2r+\xi))^2)+$ 

 $\frac{1}{2}r_1 \xi \sqrt{(96(12 \lambda - v)(r_1 + r_4 + r_5)(2 \lambda + t_1)\xi} +$ 

 $4(v.(r_1+r_2+r_3)+12\lambda(r_1+r_2+r_3+\xi)+6t_1(2r_1+2r_4+2r_5+\xi))^2)+$ 

 $\frac{1}{2}r_{4}\xi_{4}\sqrt{(96(12\lambda_{1}-v_{1})(r_{1}+r_{1}+r_{3})(2\lambda_{1}+t_{1})\xi_{1}}+$ 

 $\frac{1}{2}r_{5}\xi\sqrt{(96(12\lambda - \kappa)(r_{1} + r_{2} + r_{3})(2\lambda + t_{1})\xi} +$ 

 $\frac{1}{2}t_1^{\xi}\xi\sqrt{(96(12\,\lambda_-v)(r_1^{}+r_4^{}+r_5^{})(2\,\lambda_+t_1^{})\,\xi_+^{}+4\,(v_1^{}(r_1^{}+r_2^{}+r_5^{})+12}$ 

 $\lambda.(r_1+r_2+r_3+\xi)+6$   $t_1(2r_1+2r_2+2r_3+\xi)))))$ 

 $((r_1 + r_2 + r_5)\sqrt{(144\lambda^2r_1^2 + 24\lambda v_1r_1^2 + v^2r_1^2 + 288\lambda^2r_1r_1^2 + 448\lambda v_1r_1^2 + 148\lambda^2r_1^2 + 148\lambda$ 

2v<sup>2</sup>r<sub>1</sub> + 144 A<sup>2</sup>r<sub>2</sub> + 24 A vr<sub>2</sub> + v<sup>2</sup>r<sub>2</sub> + 288 A<sup>2</sup>r<sub>1</sub> +

48 v.r. t. +576 A.r. t. +48 v.r. t. +288 A.r. <sup>2</sup> t. + 1 5 1 4 5 1 4 5 1

 $144\lambda^{2}r^{2} + 24\lambda vr^{2} + v^{2}r^{2} + 288\lambda r^{2}t + 124vr^{2}t + 1$  24 1 1 5 + 864 1 5 5 - 24 1 1 1 5 + 720 1 1 1 5 - 12 1 1 5 +  $720 \, \lambda_1 \, t, \, \xi$  -12  $v.r.t. \, \xi$  +720  $\lambda_1 \, r.t. \, \xi$  -12  $v.r.t. \, \xi$  +144  $v.t.^2 \, \xi$  +  $\frac{1}{4}$   $\frac{1}{1}$   $\frac{1}{1}$   $\frac{1}{1}$ 

 $24 v_r {}_5^2 t_1 + 144 t_1^2 t_2^2 + 288 t_1 r_t^2 + 144 t_2^2 t_2^2 + 288 r_1 r_t^2 + 288 r_1 r_1^2 + 288 r_1 r_1^2 + 288 r_1 r_1^2 + 288 r_1 r_1^2 + 288 r_1^2 r_1^2 + 2864 \lambda^2 r_1^2 r_2^2 + 24 \lambda^2 r_1^2 r_1^2 + 864 \lambda^2 r_1^2 r_2^2 + 24 \lambda^2 r_1^2 r_1^2 r_1^2 + 24 \lambda^2 r_1^2 r_1^$ 

Pole residue:  $\frac{1}{\lambda} > 0$ 

Polarisations: 2

Massless particle

 $k^{\mu} = (p, 0, 0, p)$ 

	Massive particle
Pole residue:	$\left  \frac{\frac{v.(r.+r2r.)+4\lambda.(v.+3r3r.+6r.)}{1.3.4.4.(v.+3r3r.4-6r.)}}{8\lambda.v.(rr.+2r.)} \right  > 0$
Square mass:	$\frac{12\lambda^{2}-\lambda \cdot v}{2v \cdot r_{1}-2v \cdot r_{3}+4v \cdot r_{4}} > 0$
Spin:	0
Parity:	Even

$2\sqrt{300125} \cdot (11 - 4 - 1) \cdot (12 - 4 - 1) \cdot (13 - $	Square mass: $\frac{1}{8(r_1+r_4+r_5)^{\xi_1}}(12\lambda.r_1+v.r_1+12\lambda.r_4+v.r_4+12\lambda.r_5+v.r_5+12r_1+12r_4+1+12r_5+1+12r_5+1+12r_5+1+1+12r_5+1+1+1+1+1+1+1+1+1+1+1+1+1+1+1+1+1+1+1$	$12r \cdot t + 12\lambda \cdot \xi + 6t \cdot \xi + \frac{1}{2}\sqrt{(96(12\lambda - v)(r + r + r)(2\lambda + t))\xi} + \frac{1}{5}$	$4(V_1, V_1 + V_2) + 12 \times (V_1 + V_1 + V_2) + 0 \times (V_1 + V_2 + V_3) = 0$	1	рро
	Square mass:			Spin:	Parity:

 $\lambda + k^2 r_1 + \frac{t_1}{2}$ 

0

 $\mathcal{A}_{\parallel} + \alpha \beta \chi$ 

0

0

 $^{2}\sigma^{\parallel}\uparrow^{\alpha\beta\chi}$ 

0

 $k^2 (\lambda + t_1)$ 

 $^{2}\mathcal{F}_{\alpha\beta\chi}$ 0

 $2^+f^{\parallel}_{\alpha\beta}$ 

 $^{2^{+}}\mathcal{H}_{\alpha\beta}$ 

 $^{2}\,\sigma^{\parallel}_{\alpha\beta\chi}$ 

 $2^+_{\bullet}\tau^{\parallel}_{\alpha\beta}$ 

 $^{2^{+}}\sigma ^{\parallel }_{\alpha \beta }$ 

Total expected gauge generators:

 $\lambda + k^2 (2r - 2r + r) + \frac{1}{3}$ 

 $^{2^{+}}\mathcal{H}^{\parallel}\uparrow^{\alpha\beta}$ 

 $^{2^{+}}f^{\parallel}\dagger_{\alpha\beta}$ 

 $\lambda + k^2 (2r_1 - 2r_3 + r_4) + \frac{1}{2}$ 

 $= \frac{i \sqrt{2}(2 \ \lambda + \epsilon_1)}{2 \ k^3 \left(2 \ r_1 - 2 \ r_2 + r_1\right) (\lambda + \epsilon_1) + \lambda \left(2 \ \lambda + \epsilon_1\right)}$ 

 $^{2+}_{\cdot \cdot \tau^{\parallel}} +^{\alpha \beta}$ 

2 k³ (2 r

 $k^4 (2r_1 - 2r_3 + r_4)(\lambda + t_1) - \frac{1}{2}k^2 \lambda (2\lambda + t_1)$ 

 $^{2^{+}}\sigma^{\parallel}\, \uparrow^{\alpha\beta}$ 

## **Unitarity conditions**

(Timeout after 10 seconds)