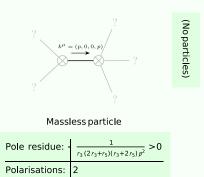
Particle spectrograph

Wave operator and propagator

Multiplicities	1	1	1	3	3	3	3	2						Δ.	25								:	#1 2 ⁺ <i>A</i> -		$\frac{1}{2} + \mathcal{F}(\alpha\beta)$ $\frac{3k^2r_3}{2}$	#1 2 ⁺ f αβ	# ¹		^{:1} σ†		$\sigma_{\alpha\beta} \stackrel{\#1}{\overset{2^+}{}} \tau_{\alpha\beta} \stackrel{\#1}{\overset{2^+}{}} \sigma_{\alpha\beta\chi}$	1		+ '6](((('						
				(1)	(1)	(1)	(1)	<u> </u>						<u>u</u>)	(1)					10.1)t3		£ [$2^{+}f^{-}$	αβ	0	0	0		^{#1} τ†	3	0 0 0			$_{\alpha}^{3}\partial_{\theta}\mathcal{R}_{\beta}^{\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ $	6	3 _k A _{\theta'} ,)))[
										+			+	τ _{βα} +		1,5	0 5	0	0	4i 2)(r3+2rg	1 ² (r ₃ +2r ₅	0	(r ₃ +2r ₅)	^{‡1}	αβχ	0	0	0	ᆛ	$\sigma^{\alpha\beta\chi}$		0 0 0		$\partial_{\theta} f_{ \theta}^{ \theta}$)-	-2 0'A ^{aβ}	rβi)+	8, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8						
						$+\partial_{\chi}\partial^{\chi}\tau^{\beta\alpha}$:	+	r ^{αβδ} +	$\partial_{\epsilon}\partial^{\alpha}\sigma^{\delta\epsilon}$	ų	, + βδα +	$\eta^{\alpha\chi} \partial_{\phi}\partial^{\phi}\partial_{\epsilon}\partial^{\beta}\sigma^{\delta\epsilon}$	$+3 \partial_{\delta} \partial^{\delta} \partial_{\chi} \partial^{\chi}$ $+ \partial_{\delta} \partial_{\alpha} \partial_{\alpha} \tau^{\chi\beta} +$	γ _γ γ _γ γ	#-	1			$\frac{4i}{k(1+2k^2)(r_3}$	$k(1+2k^2)^2 (r_3+2r_5)$	6 1 ² (12.	$(1+2k^2)$	f_{α}^{+1}	0	0	2 = 1. 4	-= 1 K ₹ 1 √2 K	0	$\frac{2k^2t_3}{3}$			+		30A 8 .	$_{\alpha}\partial_{\theta}\mathcal{A}_{\beta}^{\ \ \ \ }+8\partial_{\beta}\mathcal{A}_{\beta\alpha}\partial_{\beta\alpha}\partial^{\theta}\mathcal{A}^{\alpha\beta})+$	8°A"						
						$+ \alpha_{\chi} \partial_{\beta} c^{\alpha\chi} +$		$^{\beta }\sigma ^{\alpha \chi \varrho }$	$+4 \ \partial_{\epsilon} \partial^{\epsilon} \partial_{\delta} \partial^{\chi} \sigma$	$u^{\beta\chi}$ $\partial_{\phi}\partial_{\phi}\partial_{\varepsilon}$	αδ _δ ==	$2 \partial_{\epsilon} \partial^{\epsilon} \partial_{\delta} \partial^{\alpha} \sigma^{PX} $ $+2 \partial_{\epsilon} \partial^{\epsilon} \partial_{\delta} \partial^{X} \sigma$	$\alpha \partial_{\phi} \partial_{\phi}$		$\eta^{\alpha\beta} \partial_{\epsilon} \partial^{\epsilon} \partial_{\delta} \partial^{\delta} \iota^{\chi}_{\chi}$	1,	τ ια			0	0		0	$\frac{*1}{1^-f_{lpha}}$	0	0 0	5 0	0 0		0	-		ofa	οθ f θ + :	$+\partial_{lpha}\mathcal{R}^{lphaeta_{i}}\partial_{ heta}\mathcal{R}^{eta}_{eta}$	F8 0 BA	7-						
				Χgα		+		$+2 \partial_{\epsilon} \partial^{\epsilon} \partial_{\delta} \partial_{\delta} \sigma^{\alpha \chi \delta}$	4	+3	$\partial_{\phi}\partial^{\phi}\partial_{\epsilon}\partial^{\epsilon}\sigma^{\alpha}$	$+2 \ \partial_{\epsilon} \partial^{\epsilon} \partial_{\delta} \partial^{\alpha} \sigma^{ ho XO} \ ^{5eta} + 2 \ \partial_{\epsilon} \partial^{\epsilon} \partial_{\delta} \partial_{\delta} \partial^{\chi} \sigma^{eta}$	+ 3	$2 \eta^{\alpha\beta} \partial_{\alpha} \partial_{x} \chi^{\chi\delta} + 2 \partial_{\alpha} \partial^{\beta} \partial^{\alpha} \chi^{\chi} + 3 \partial_{\alpha} \partial^{\beta} \partial_{\chi} \partial^{\chi} \chi^{\alpha\beta} + 3 \partial_{\alpha} \partial^{\delta} \chi^{\chi\delta}$ $2 \eta^{\alpha\beta} \partial_{\alpha} \partial_{\alpha} \chi^{\chi\delta} = 3 \partial_{\alpha} \partial^{\beta} \partial_{\chi} \partial^{\alpha} \chi^{\beta\chi} + 3 \partial_{\alpha} \partial^{\beta} \partial_{\chi} \partial^{\alpha} \chi^{\chi\beta}$	2 n ^{aβ} 2		0	0	0	3+275)	2r ₅)t ₃	0	5) t3	ľα			V2 t3	[m]	e 0	2 k ts			-2 B	9,5 a 9	$\alpha^{\beta} + \beta$	β, β	$-(\partial_{\alpha}\mathcal{B})$						
			αβ	$== \partial_x \partial^x \partial_\beta \tau^{\alpha\beta} + 2 \partial_\delta \partial^\delta \partial_\chi \partial_\beta \sigma^{\alpha\beta\chi}$		$\partial_{\chi}\partial^{\alpha} \tau^{\beta\chi} + \partial_{\chi}\partial^{\beta} \tau^{\chi\alpha} + \partial_{\chi}\partial^{\chi} \tau^{\alpha\beta} = \hat{q}_{\lambda}\partial^{\alpha} \tau^{\chi\beta}$	$+ \partial_{\delta} \partial^{\delta} \partial_{\chi} \sigma^{\alpha \beta \chi} == \partial_{\delta} \partial_{\chi} \partial^{\beta} \sigma^{\alpha \chi \delta}$	δ	$\ni^{\beta}\sigma^{\chi\delta\alpha}$		$\eta^{\beta\chi} \partial_{\phi}\partial_{\phi}$	$\sigma^{ao}_{\delta} + \sigma^{b}_{\delta}$	$+2 \partial_{\epsilon} \partial^{\epsilon} \partial_{\delta} \partial^{\delta} \sigma^{\alpha X \beta}$	$+3 \partial_{\delta} \alpha$ $+ \partial_{\lambda} \partial_{\alpha} r$	$3 \partial_o \partial^o \partial_\chi \partial^\beta \tau^{\alpha\chi} + 3 \partial_o \partial^o \partial_\chi \partial^\beta \tau^{\chi\alpha} + 2$ rators:	15	0	0	0	$2\sqrt{2}$ $1+2k^2$) $(r_3$	$(k+2k^3)^2 (r_3+2r_5)t_3$	0	+2 k²)² (r₃	1-3	0	0		1	O E	-1 1 12 k			R .	jξα 'fα	B O'AAB	Aabada	£ 50		;	#1 O ⁺ <i>F</i> (#1 0 ⁺ f	#2 0+ f	#1 0 . <i>4</i> 1
			$^{\chi}\partial^{\chi}\partial_{\beta}\sigma$	+2 0,00		$\chi_{\tau^{\alpha\beta}} ==$	× == 36	$\partial^{\chi}\partial^{\alpha}\sigma^{\beta_{i}}$	$+2 \partial_{\epsilon} \partial^{\epsilon} \partial_{\delta} \partial^{\beta} \sigma^{\chi \delta}$	$\partial_{\epsilon}\partial^{\epsilon}\partial_{\delta}\hat{c}$	+3 1	$+3 \ \partial_{\epsilon} \partial^{\epsilon} \partial^{\chi} \partial^{\beta} \sigma^{\alpha \sigma}_{ \delta}$ $^{5\chi} + 2 \ \partial_{\epsilon} \partial^{\epsilon} \partial_{\delta} \partial^{\alpha} \sigma^{\chi \circ}_{ }$	$\partial_{\epsilon}\partial^{\epsilon}\partial_{\delta}\dot{c}$	$\frac{+3}{6} \frac{\eta}{\sigma} x^{\chi} + 3$ $= 3 \frac{3}{6} 3$	$_{5}\partial ^{5}\partial _{\chi}\partial ^{6}$					k ² (1		13/2/	k(1+	α			2 2 43			****			5	σ , σ	+ 0,99,8	-20'9	, ×	#1 0+ <i>F</i> 4			-i √2 k ts		0
	0 ==		$\partial_{\beta}\partial_{\alpha}\tau^{\alpha\beta} == \partial_{\beta}\partial^{\beta}\tau^{\alpha}_{\alpha} + 2 \partial_{x}\partial^{x}\partial_{\beta}\sigma^{\alpha\beta}$	θβταβ +	$\partial_{\beta} t^{\beta \alpha}$	$^{\chi} + \partial_{\chi} \partial$	$^{\delta}\partial_{\chi}\sigma^{\alpha\beta}$	$\partial_{\epsilon}\partial_{\delta}\partial^{\chi}\partial^{\alpha}\sigma^{\beta\delta\epsilon} + 3 \ \partial_{\epsilon}\partial^{\epsilon}\partial^{\chi}\partial^{\alpha}\sigma^{\beta\delta}$						$\int_{\lambda} \int_{\lambda} \int_{\alpha} \int_{\alpha$	(+3 <i>0</i>)	,	g O			+2r ₅))(r ₃ +2r ₅)	-	2.7	$1^*\mathcal{A}_{lpha}$	0	0		$\frac{3}{2} + r_5) + \frac{\sqrt{2}t_3}{\sqrt{2}}$	0	2 <i>i k</i> ≰ 3			$-\frac{2}{3}t_3(\mathcal{A}^{\alpha\prime})$, 8	$\mathcal{A}^{\alpha\beta}$	(2)	8,	#1 0 ⁺ f		√2 k ts	$2 k^2 t_3$	0	0
form	∂ ^δ σ ^{αβχ} =:	0	ϕ^{2}	:= 9,0×	$\partial_{\chi}\partial_{\beta}\partial^{\alpha}\tau^{\beta\chi} == \dot{q}^{\partial\chi}\partial_{\beta}\tau^{\beta\alpha}$	$^{3\chi^{2}g}\mathcal{O}^{\chi}$	+ 000	₇ βδέ +	$_{\delta}\partial^{eta}\sigma^{lpha}$	$2 \partial_{\epsilon} \partial^{\epsilon} \partial_{\delta} \partial^{\chi} \sigma^{\alpha \delta \beta} + 2$	$3 n^{\alpha \chi} \partial_{\phi} \partial^{\phi} \partial_{\epsilon} \partial_{\delta} \sigma$	$3 \partial_{\epsilon} \partial_{\delta} \partial^{X} \partial^{\beta} \sigma^{\alpha o \epsilon} + 4 \partial_{\epsilon} \partial^{\epsilon} \partial_{\delta} \partial^{\alpha} \sigma^{\beta \delta X}$	$4 \partial_{\epsilon} \partial^{\epsilon} \partial_{\delta} \partial^{\delta} \sigma^{\alpha \beta \chi}$	$\int_{\lambda} \int_{\beta} \int_{\beta} \int_{\alpha} \int_{\alpha$	$\frac{\lambda_{\chi}\partial^{\beta}\mathbf{t}^{\alpha)}}{z}$:	; ;;;	0	0	0	k ² (r ₃ +	$k^2 (1+2k^2)(1+2k^2)$	0	$-\frac{k(1+2k^2)(k^2)}{(k^2)(k^2)}$	fαβ			, .	K ² (3					$\sigma_{\alpha \hat{k} \chi}$	A B B	$r_3 (\partial_{eta} \mathcal{A}_{,\ eta}^{\ eta}, \partial_{\dot{\beta}} \mathcal{A}_{,\ eta}^{\ eta})$	a stable	Z G Z	#2 0 ⁺ f		0	0	0	0
	xo go	- !!	-αβ ==	$\partial_{\chi}\partial_{\beta}\partial^{\alpha}\tau^{\beta\chi}=$	= χ _θ 1 _α (βχ + χ _θ -	$\partial_\delta \partial_\chi \partial^\alpha \sigma^{\beta \chi \delta}$	$_{\delta}\partial^{X}\partial^{\alpha}c$	$4 \partial_\epsilon \partial^\epsilon \partial_\delta \partial^\beta \sigma^a$	2 ∂ _e ∂ [€] 2	3 17 ^{0X}	, 9,63 ^X C 1,9 <u>,</u> 63	1 0 c 0 c 0	$x^{\partial^{\beta}\partial^{\alpha}}$	$3 \partial_{\delta} \partial^{\delta} (2 - 3 \partial_{\delta} \partial$	+17				0	1,3		17	1 + 1	٥								$\mathcal{A}^{\alpha\beta\chi}$	2	r3 (0	0	(3,99 , 2] d	#1 0 <i>F</i>	7 +	0	0		0
Covariant	$\epsilon \eta_{\alpha \beta \chi \delta}$	$\partial_{\beta}\partial_{\alpha}\tau^{\alpha\beta}$	$\partial_{\beta}\partial_{\alpha}$ 1	$\partial_\chi \partial_\beta \hat{c}$	$\partial_\chi \partial_\beta \hat{c}$	$\partial_{\chi}\partial^{\alpha}$	$\partial_{\delta}\partial_{\chi}\dot{c}$	$\partial_{\varepsilon}\partial$.,	,	ж -		0,00	gener	+17		0	0	+	4	0	م ا	$^{#2}_{1}^{2}$	0	0		0	0	0			t 08 +		1 2	:	r5 t, x, y,		ď	#1) ⁺ σ	^{#1} τ	#2 0 ⁺ τ	^{‡1} σ
			0==	α == 0				ж						4	lauge	#5 ++	0 0	0	0	0	0	0	0	ιβ 1	- 75)		+	• •	-	•								^{#1} ₀ ⁺ σ	† (1+	$\frac{1}{(2k^2)^2t_3}$	$-\frac{i\sqrt{2}k}{(1+2k^2)^2t_3}$	0	0
y form			Ь	$+2ik_1^{#2}\sigma$		0	0	0 ==						0	Total expected gauge generators:	, + + 12	$\frac{1}{k^2(2r_3+r_5)}$	0	0	0	0	0	0	$1^{*}_{1}^{\mathcal{A}_{\alpha\beta}}$	$k^2 (2 r_3 + r_5)$	0 0		0	0	0			S == [[[[(f ^{αβ}					#1 0 ⁺ τ	† (1+	$\frac{\sqrt{2} k}{(2k^2)^2 t_3}$	$\frac{2k^2}{{(1\!+\!2k^2)}^2t_3}$	0	0
Spin-parity	0==	0==	#1 #1 #1 0 ⁺ τ-2 i k0 ⁺ α	x +2 L	$_{1}^{\#1} _{\tau}^{\alpha} == 0$	αβ == 0	$a\beta = 0$							H	expe	# -	βı		αβ	φ + σ	3 ₊ -	σ ₊ ~		_	ιβ	αβ αβ	α	+ + +	- α+	+ α]		ς,					#2 0 ⁺ τ	t	0	0	0	0
Spin	#1 0 σ	#2 0+ r	#1 0+ t	$^{#2}_{1}^{\alpha}$	#1 ($\frac{#1}{1}\alpha\beta$	1+0	$^{#1}_{2} \alpha \beta \chi$						#1 aß 2+ t	Tota		$^{*1}_{1}^{\prime}\sigma^{\dagger}$	$^{#2}_{1}^{\alpha}\sigma^{lpha}_{1}$	$1^{*1} \tau^{\alpha\beta}$	$\frac{*1}{1}\sigma^{+}$	π2 1 σ†	$\frac{\#1}{1}\tau^{\alpha}$	1- 1+		1+34+°	$_{1}^{#2}_{+}$ 3.	1^+f^+	$1^{-}\mathcal{A}^{+}$ $1^{-}\mathcal{A}^{+}$	$^{*1}_{f}$	$\frac{#2}{1^-f}$								#1 0 σ	t	0	0	0	0

Massive and massless spectra



Unitarity conditions