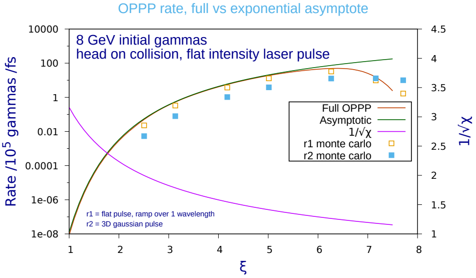
Matching the OPPP exponential



- Simplify OPPP to understand mc signal
- fit: $\sqrt{\frac{27}{32}}\,\chi\, e^{-\frac{8}{3\chi}(1-1/15\xi^2)}, \quad \chi = \xi \frac{k\cdot k_i}{m^2}$
- fit validity: $\xi \gtrsim 1/\sqrt{\chi} \gg 1, \; (2 \lesssim \xi \lesssim 5.5)$
- Why does the rate decline for higher ξ?
- threshold number of laser photons, $n_{\text{min}} = \frac{2m^2(1+\xi^2)}{k\cdot k_i}$
- More intense laser provides more energy, but the pair rest mass also increases
- Gaussian pulse compared to flat pulse: less ξ overall
- Monte carlo can help understand experimental fits

IPstrong v1.1.00 data sets, update 29/10/2020

- Completed phaseII e-laser, g-laser configurations with $w_0 = 3, 4, 5, 6, 7, 8\mu$m

Aug-Oct 2020 Data Runs, bunch/pulse crossings completed

Experiment Config	$w_0 = 3\mu$m	3.5μm	4.0μm	4.5μm	5.0μm	6.5μm	8.0μm	10.0μm	13.0μm	15.0μm	20.0μm	50.0μm	100.0μm
peak SQED ξ	5.12	4.44	3.88	3.45	3.1	2.39	1.94	1.553	1.195	1.04	0.78	0.31	0.15
peak SQED χ (16.5 GeV)	0.9	0.79	0.69	0.61	0.55	0.42	0.34	0.275	0.212	0.183	0.138	0.055	0.028
JETI40 e-laser 16.5 GeV	10000	6000	5994	6000	6000		10000	1000	1000	1000	500	5000	500
JETI40 e-laser 17.5 GeV	1000	1000	1000	1000	1000		1000						
JETI40 g-laser (coarse) 16.5 GeV	1000	1000	999	1000	1000		1000						
JETI40 g-laser 16.5 GeV	5000	2000	2000	2000	2000	2000	2000						
JETI40 g-laser 17.5 GeV													
JETI40 ics-laser 16.5 GeV													
JETI40 ics-laser 17.5 GeV													
JETI40 misalignments													

	pulse shape	$w_0 = 3.0\mu$m	$w_0 = 4.0\mu$m	$w_0 = 5.0\mu$m	$w_0 = 6.0\mu$m	$w_0 = 7.0\mu$m	$w_0 = 8.0\mu$m	$w_0 = 9.0\mu$m	$w_0 = 10.0\mu$m	$w_0 = 11.0\mu$m	$w_0 = 12.0\mu$m		
peak SQED ξ	gauss	16.7	12.53	10.03	8.35	7.16	6.27	5.57	5.01	4.56	4.18		
peak SQED χ (16.5 GeV)	gauss	2.96	2.22	1.78	1.48	1.27	1.11	0.99	0.89	0.81	0.74		
phaseII e-laser 16.5 GeV	gauss	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		
phaseII e-laser 17.5 GeV	gauss	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		
phaseII g-laser 16.5 GeV	gauss	2000	1000	1000	1000	1000	1000	2000	2000	2000	2000		
phaseII g-laser 16.5 GeV	flatTR						2285	2000	2000	2000	2000		
phaseII g-laser 17.5 GeV													
phaseII ics-laser 16.5 GeV							1000						
phaseII ics-laser 17.5 GeV													
phaseII misalignments													

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