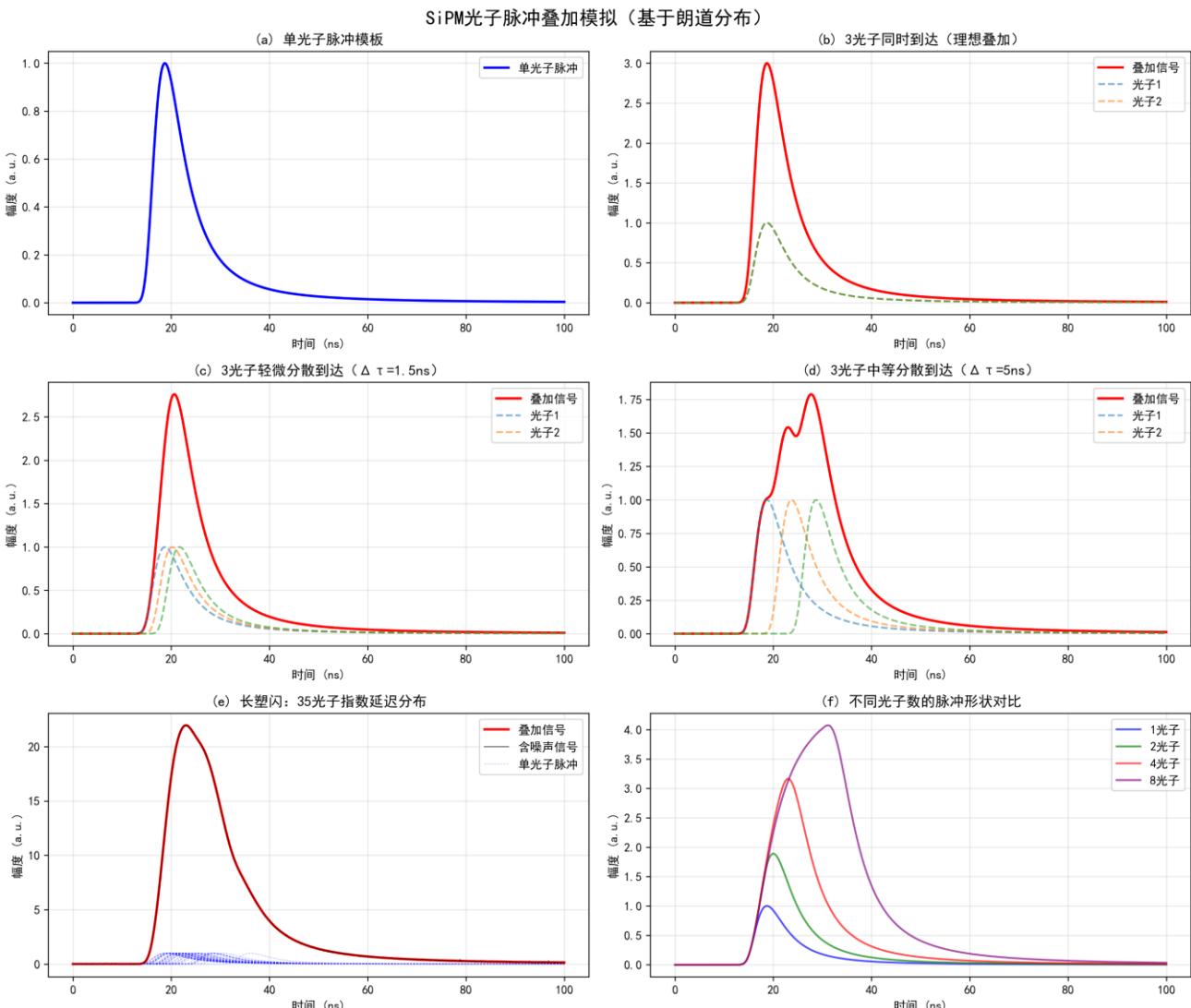
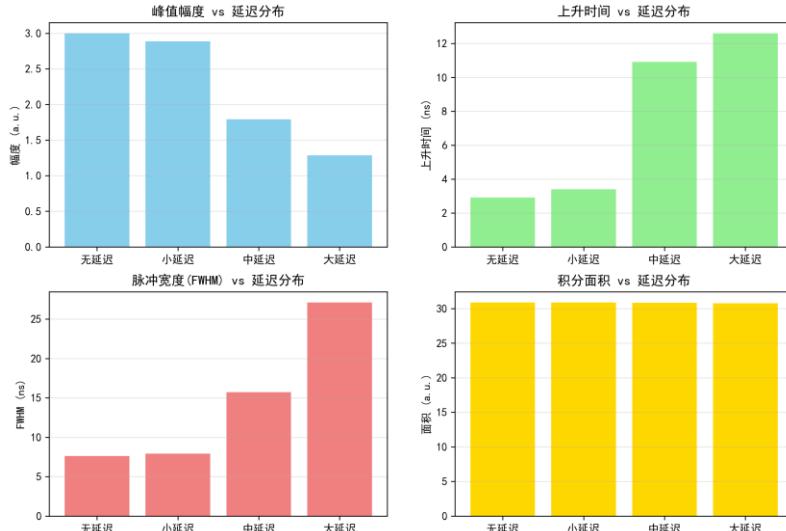


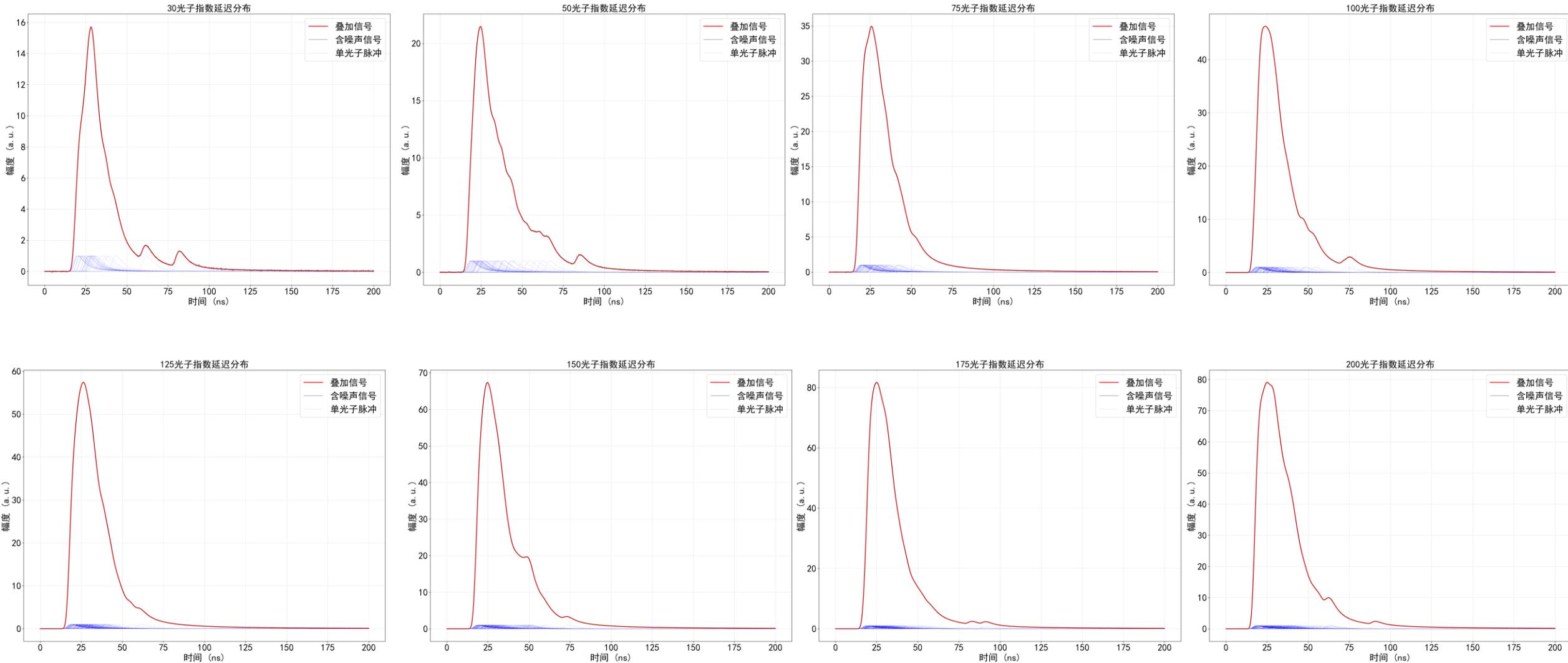
Simulation of pulse from LS

Issue: signal at far end of LS

- 单光子脉冲: 朗道分布
- 不同单光子脉冲线性叠加
- Fig (e): 光子延迟时间按照指数衰变分布
- 积分面积不随延迟变化而变化, 幅度随延迟变大而变小

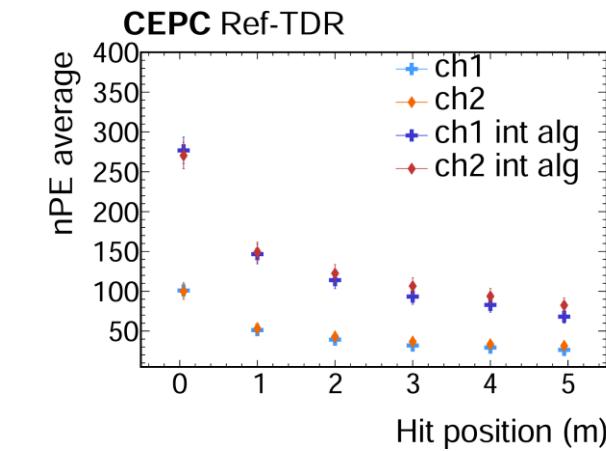
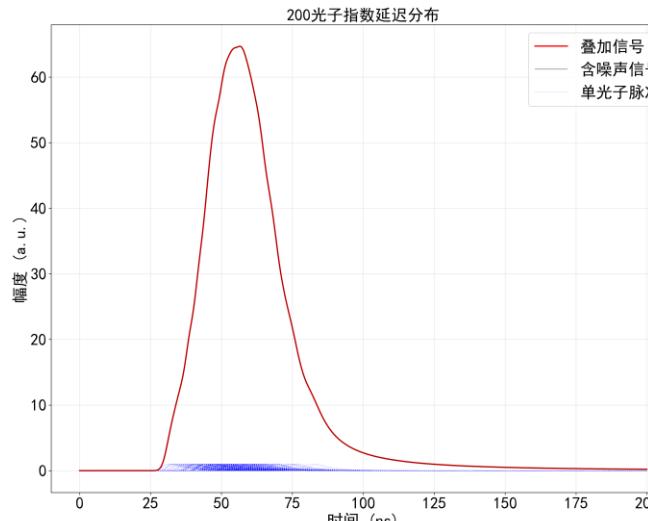
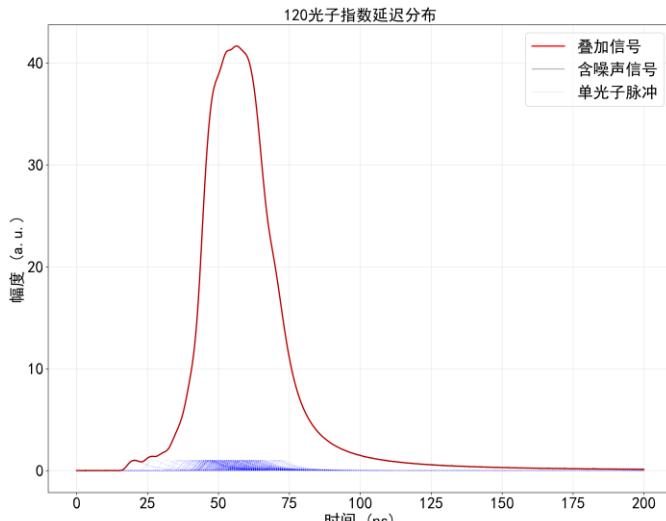
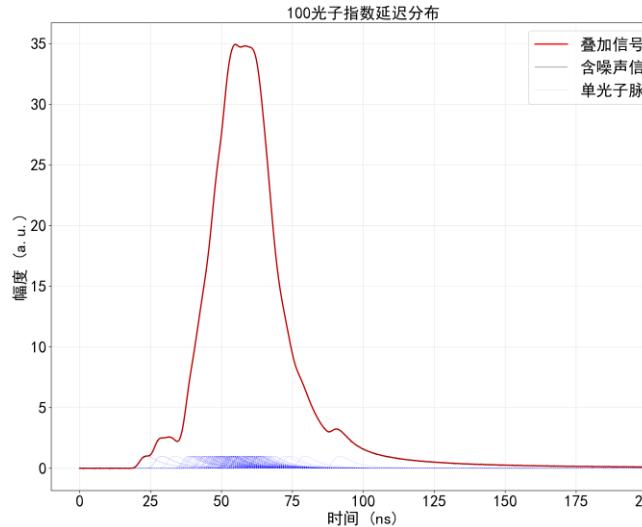
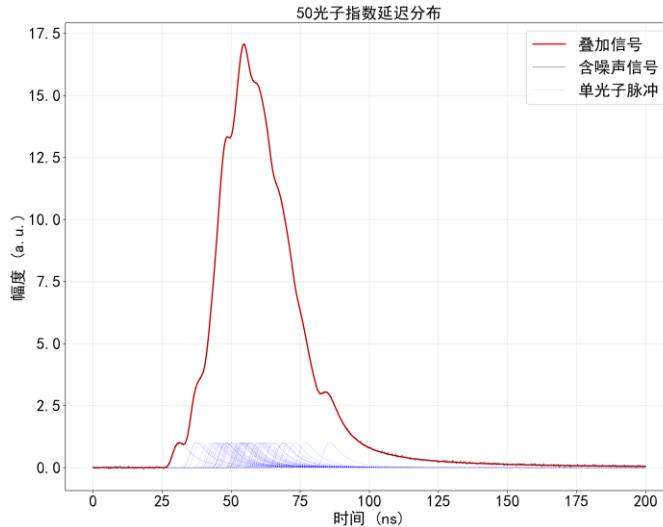


Simulation of pulse from LS

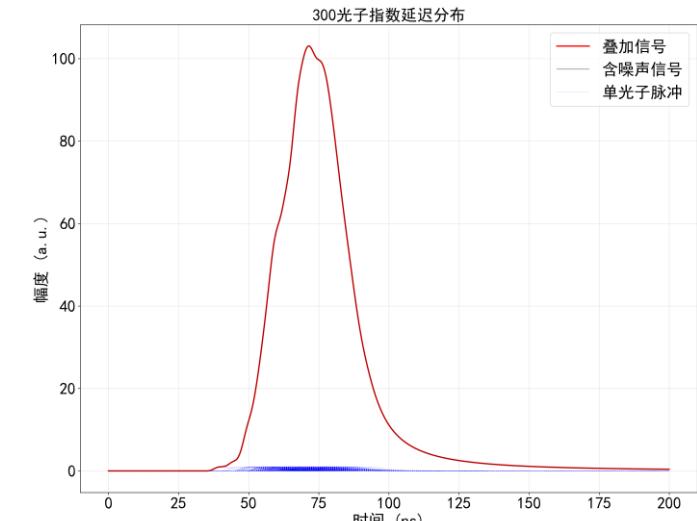


Simulation of pulse from LS

到达时间高斯分布



	A	B	C	D	E	F	G
1	Distance	ch1	ch1 int	div1	ch2	ch2 int	div2
2	0.05	100.97	276.89	2.7423	99.82	270.39	2.708776
3	0.1	51.2	146.63	2.863867	53.22	149.24	2.804209
4	0.2	39.3	113.99	2.900509	42.96	122.43	2.84986
5	0.3	31.92	93.27	2.921992	36.65	106.48	2.905321
6	0.4	29.29	82.84	2.828269	33.33	93.72	2.811881
7	0.495	26.34	68.1	2.585421	31.44	82.41	2.621183



Waveform Decomposition algorithm

最终测得波形 $y(t)$ 可以表示为

$$y(t) = \sum (A_i \cdot s(t - \tau_i)) + b(t) + n(t)$$

- $s(t)$: 单光子响应波形模板 (通过实验测量)
- A_i : 第*i*个光子事件的幅度
- τ_i : 第*i*个光子事件的准确到达时间
- $b(t)$: 基线
- $n(t)$: 随机噪声

目标: 在已知 $y(t)$ 和 $s(t)$ 的前提下, 最优地解出一组 $\{A_i, \tau_i\}$