

Harris Labs

Statistics of a Post-selected Thermal State

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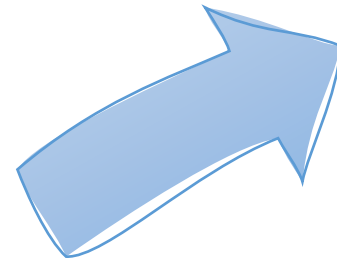
Yale

Quantum Week [at] Yale

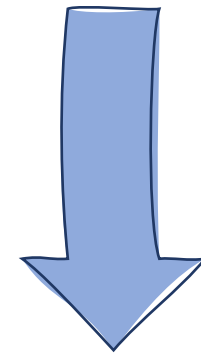
POST-SELECTED STATE



Thermal state



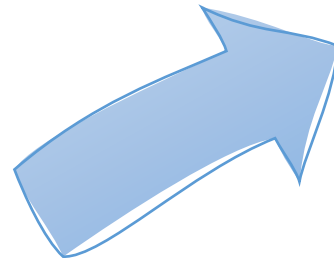
Mean
Phonon
number



POST-SELECTED STATE



Thermal state

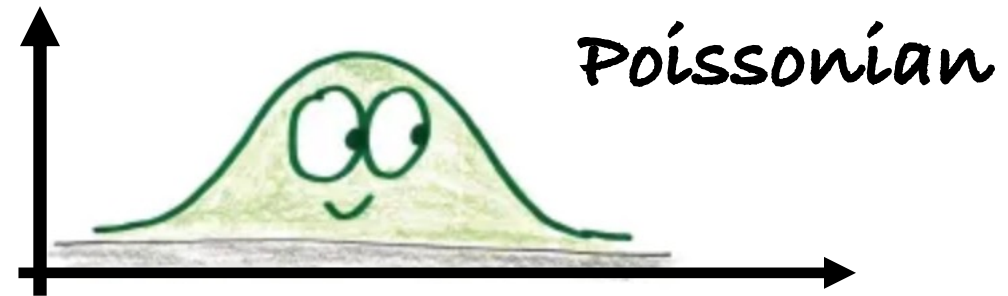
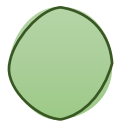


Mean
Phonon
number

~~2~~ 2

POST-SELECTED STATISTICS

Thermal state



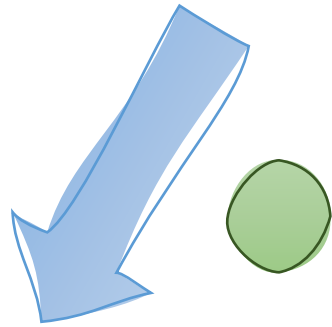
$$P(n) \sim \text{Pois}(\lambda)$$

$$\hat{a}|n\rangle = \sqrt{n}|n-1\rangle$$

$$P(n-1)|_{-1} \propto nP(n)$$

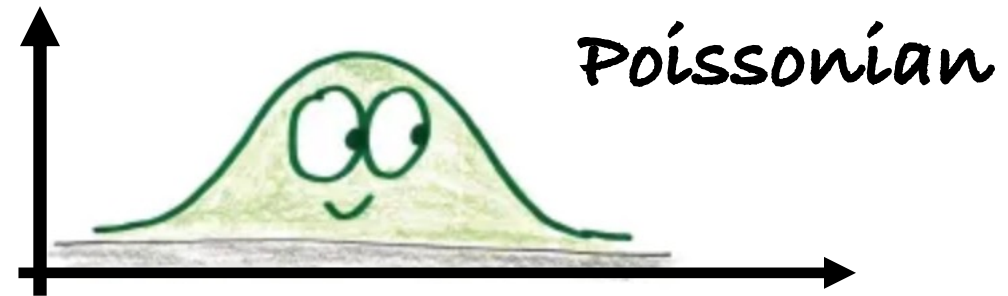
POST-SELECTED STATISTICS

Thermal state

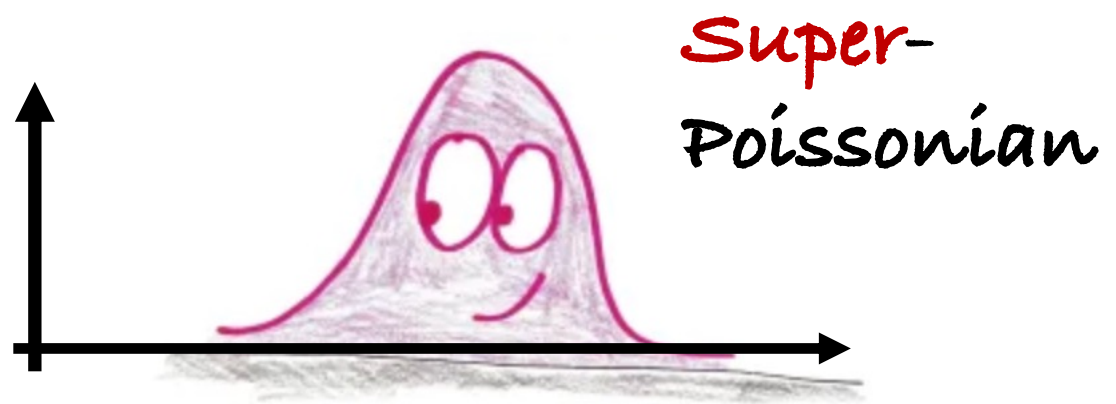


Bayesian updating

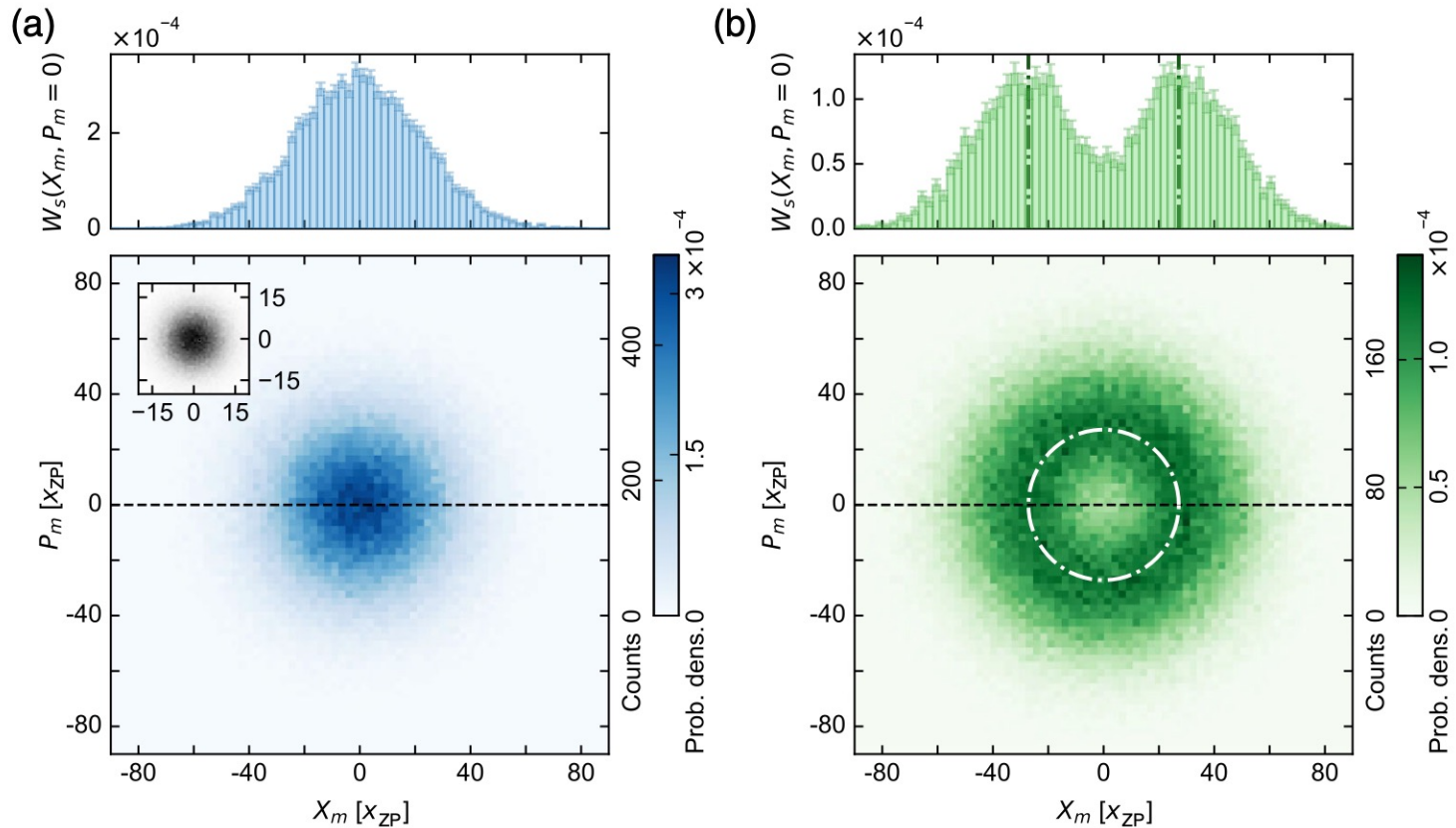
Post-selected state



Bunching!



POST-SELECTED STATISTICS



A post-selected state has **richer** information!

Quantum **enhanced** sensing!

G. Enzian, *et al*, *PRL* 127, 243601 (2021)

EXPERIMENT IN WL

