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19.5.2016 In experient: split up maxes. Pa probabilities per detection Good approximation if P. « I (avoid saturation) Px >> Phase (negligible stock Note: A more reclistic detection operator (state D = A - (1-Pde) (1-y) : 1 minus probability of having neither photon nor dark count Non also: Normalized correlation hunching factor out the loss of photons (conditional measurements, post-sulection) 13 Quantum Light Sources Light with properties that cannot be explained by classical theory (exception: shot noise) Examples (single-mode) - Fock states (go at non-dassical) - Squeezed states (continuous vanables, not triald)



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Examples (multi-mate)  - Entangled states (polarization, photon number, energy, orbitid angulis maren term.)  18.1 Single-photon socies  Requires single emotive Possibilities:  - single molecule  - single atom  - MV-centur or similar  - Quantum dots  Parameters:  - Yield (emotive photon) per request  - Collection efficiency  - Indi-tingualization to photon and emotites.)  Sides		17.0.2
- Entangled stats (polarization, photon number, energy, orbital angular momentum)  15.1 Single-photon surius  lequires single emeter. Possibilities: - single molecule - single atom - NV-centur or similar - Quantum obts  Parameters: - Yield (emethod photons per request) - Collection efficiency - Indi-tinguishability (photon and emitters)		
Parameters:  - Sugar Single emeter Possibilities:  - Single molecule  - single about  - Mr-centur or similar  - Quantum abots  Parameters:  - Yild (emitted photons per request)  - Collection efficiency  - Indi-tinguishability (photon and emitters)	Examples (mult-male)	
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Requires single emoter Possibilities:  - single molecule  - single aborn  - Mr-center or similar  - Quantum dots  Parameters:  - Yield (emitted photons per request)  - Collection efficiency  - Indi-tinguishability (photon and emitters)	-+	
Requires single emitter. Possibilities:  - single molecule  - single alom  - Mr-center or similar  - Quantum dots  Parameters:  - Yield (emitted photons per request)  - Collection efficiency  - Indi-tinguishability (photon and emitters)	13.1 Single-photon Courses	
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- single molecide  - single alom  - MV-center or similar  - Quantum alots  Parameters:  - Yield (emithal photons per request)  - Collection extra new  - Indi-tinguishability (photon and emitters)	2001 Signt of 11 Post 12 12 12 12 12 12 12 12 12 12 12 12 12	
- single alom  - Mr-centur or similar  - Quantum dots  Parameters:  - Yeld (emithal photons per request)  - Collection extremily  - Indictinguishability (photon and emitters)	Regulas single emitta, 104st prunes	
- single alom  - M - centur or similar  - Quantum dots  Parameters:  - Yield (emithal photons per request)  - Collection extremaly  - Indictinguishability (photon and emitters)		
- MV - centur or similar  - Quantum dots  Parameters:  - Yield (emithal photons per request)  - Collection efficiency  - Indi-tinguishability (photon and emitters)	- Single molecide	
- MV-centur or similar  - Quantum dots  Parameters:  - Yield (emithal photons per request)  - Collection extresing  - Indi-tinguishability (photon and emitters)		
- MV-centur or similar  - Quantum dots  Parameters:  - Yield (emithal photons per request)  - Collection extresing  - Indi-tinguishability (photon and emitters)	single alom	
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- Yield (emithal photons per request)  - Collection efficiency  - Indi-tinguishousility (photon and emitters)		
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	- Inditional profitate opporer and envilled	
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13.2 Photon-Pair sources	
It is districult to entample two	
= easier to general an entance	gled pair
Creating photon pairs by casea	de Dicay (Aprict 1981)
42 Solom SSIAM Afor	decays back to
4p. P. grou	nd slah by unithing the
423pm phony	4.
45 is Enta	noted in plantation!
Catain alms	
Photon-pair sources band on no	n-linear materials
pure phonen	
Principle crystal	
Simple model:	prosp / des
Intraction Hamiltonian: H=	3 4
Intrachon numicionicai. H	
	Humitian!
Cannot be solved analyte	ally (as far as I know,



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		19.5.20
Non-depleted	(classical) pump appro.	ximation:
Ascume pun	mp in coherent state lx>	1. H ~ 35 /
	$ \alpha\rangle = \alpha  \alpha\rangle$ and $a^{\dagger}$	$\alpha > 2\alpha * /\alpha >$
> 1/2 to	x (x b'c' + \$bc)	
We want to	know what happens t	to modes b and c,
when they	an initially in vacuum.	
+		