Contents

1	Intr	roduction	13
2	$Th\epsilon$	eory	15
	2.1	Photophysics of fluorescent molecules	15
	2.2	Modeling light-molecule interaction	16
		2.2.1 Jaynes-Cummings model	17
		2.2.2 Lindblad master equation	19
		2.2.3 Spectrum of a two-level system	19
	2.3	Photon statistics of a single emitter	19
		2.3.1 Second order coherence function	19
		2.3.2 Photon waiting time distribution	19
	2.4	Emission collection strategies	19
		2.4.1 Dipole at a dielectric interface	19
		2.4.2 Free space collection	20
		2.4.3 Fiber coupling	21
3	Experimental setup		
	3.1	Free space experimental setup	23
	3.2	Fiber-coupled experimental setup	23
4	Alig	gnment free fiber coupled SPS	25
	4.1	Bare fiber tip coupling	25
	4.2	On-tip collection optics	25
	4.3	Outlook	25
5	Pul	se-induced transparency	27
	5.1	Experimental observations	27
	5.2	Simulation results	27
	5.3	Outlook	27
6	Emitter efficiency estimation with photon statistics		29
	6.1	Waiting time distribution	29
	6.2	Deduction of emitter's efficiency	29
	6.3	Outlook	29
7	Cor	nclusions	31