



Test of high power lasers for AdvLIGO

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for the measurement team

LSC meeting, LLO March 2003



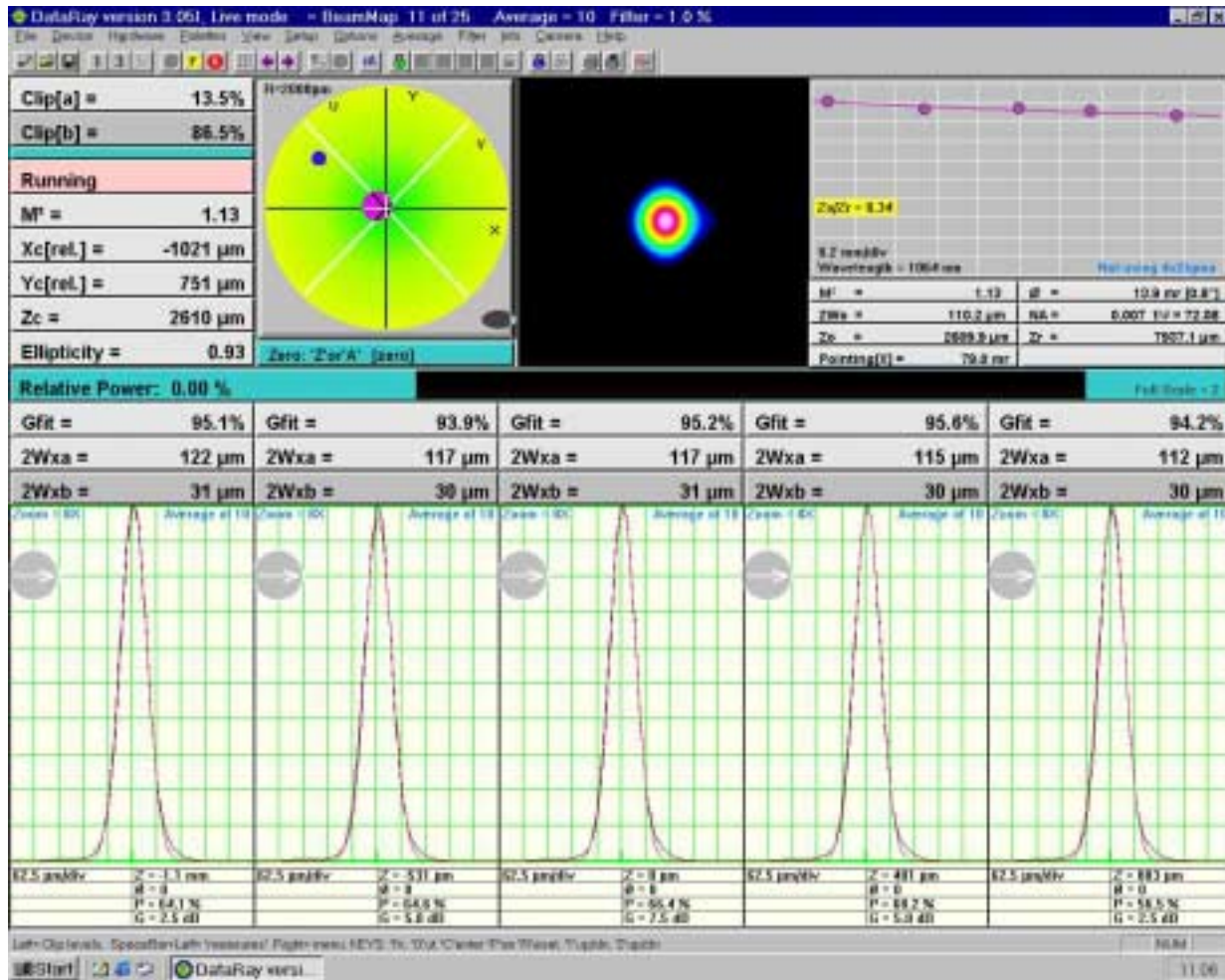
- design studies 1/01 – 3/03
 - *compare different topologies and head designs at the 100W level*
- conceptual design 3/03 – 5/04
 - *demonstrate a laser at the 200W level close to noise requirements*
- final designs 5/04 – 9/05
 - *build first article (LASTI laser) that meet noise and reliability requirements*
- fabrication 1st unit 9/05 – 6/06

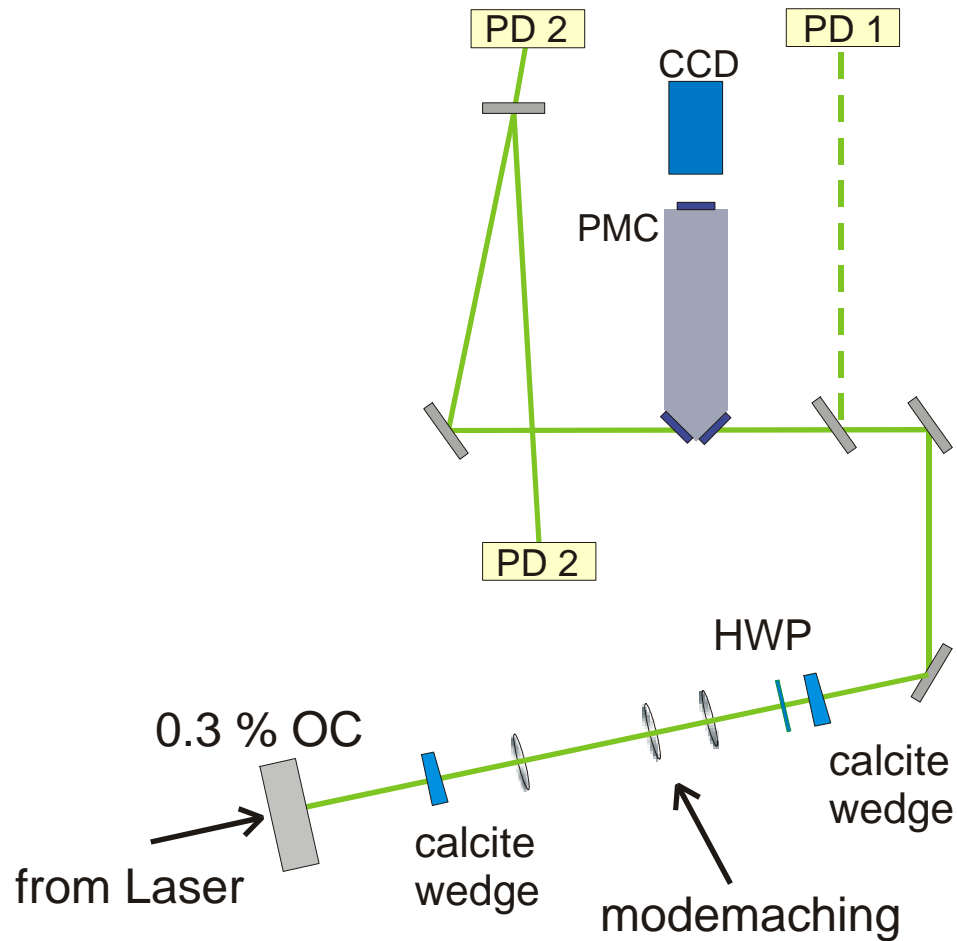


team with representative from each laser lab and LIGO/GEO spend one week in the different labs to understand operation and do some measurements

- system complexity
- output power
- spatial beam profile
- power / frequency noise
- polarization stability / noise
- pointing



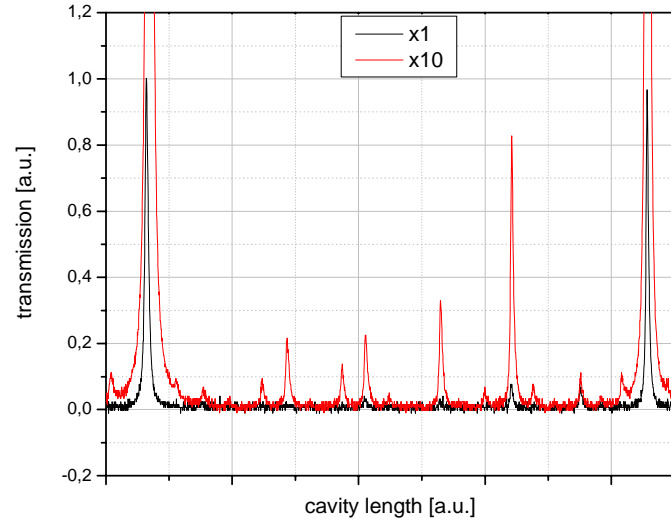
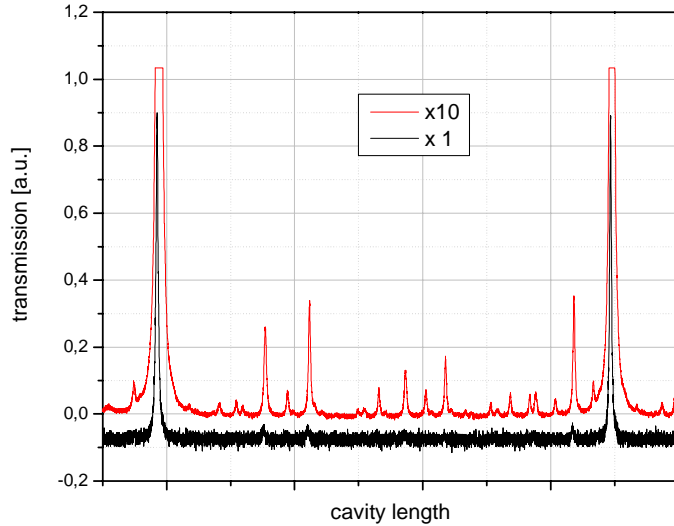




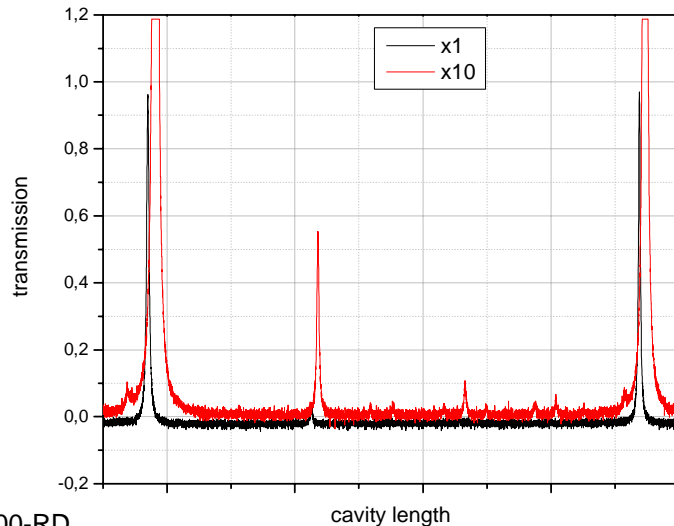
- laser output power
- spatial mode content
 - transmission of scanning cavity
 - transmission of locked cavity
- power noise before and after cavity



80W LZH Laser, measured 5.3.03



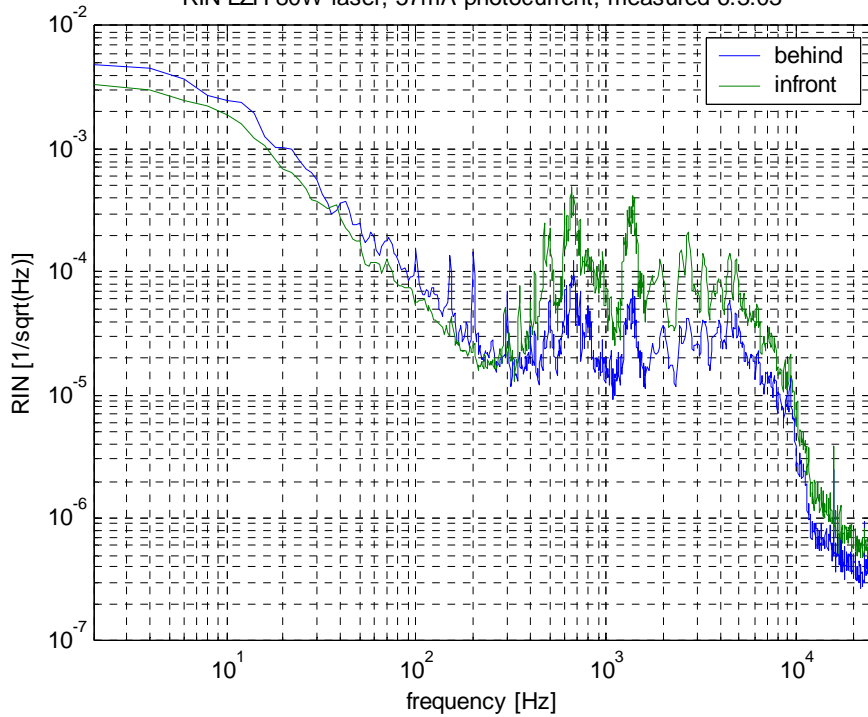
12W LZH Laser, measured 5.3.03



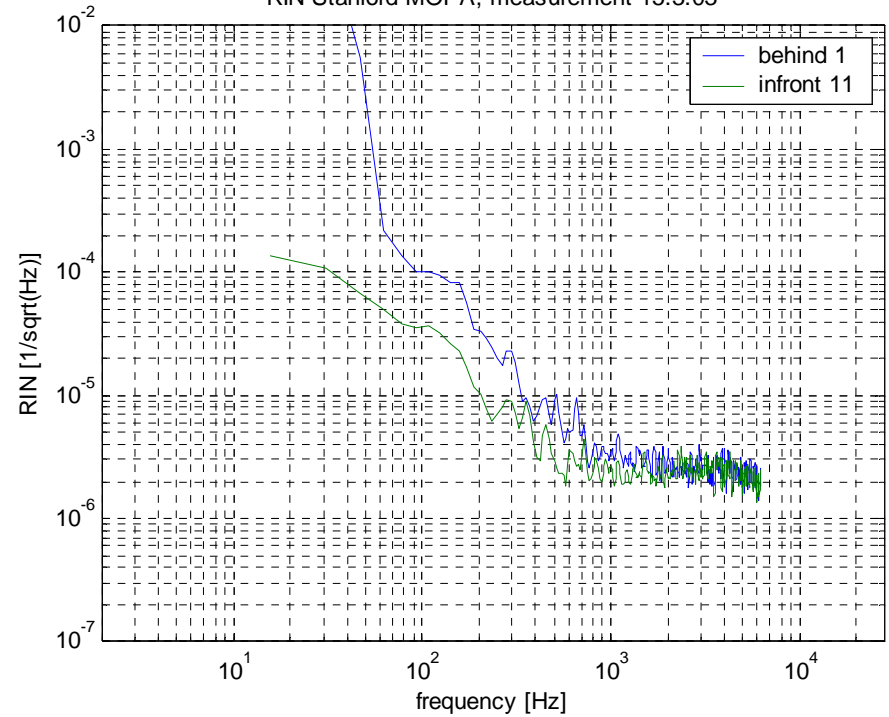
	mode count	locked
Oscillator:	T=81%	T=74%
MOPA:	T=84%	T=73%



RIN LZH 80W laser, 57mA photocurrent, measured 6.3.03

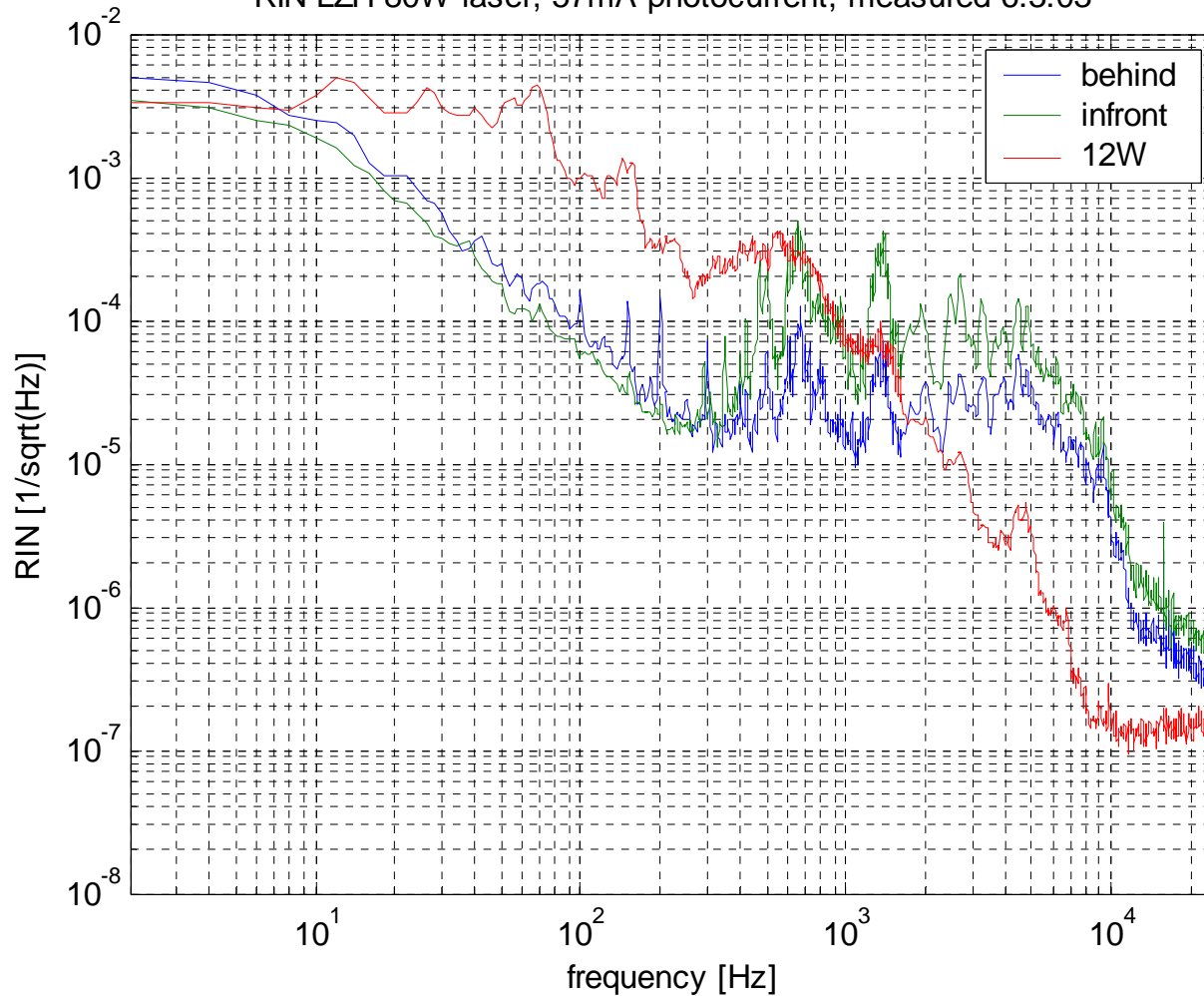


RIN Stanford MOPA, measurement 15.3.03



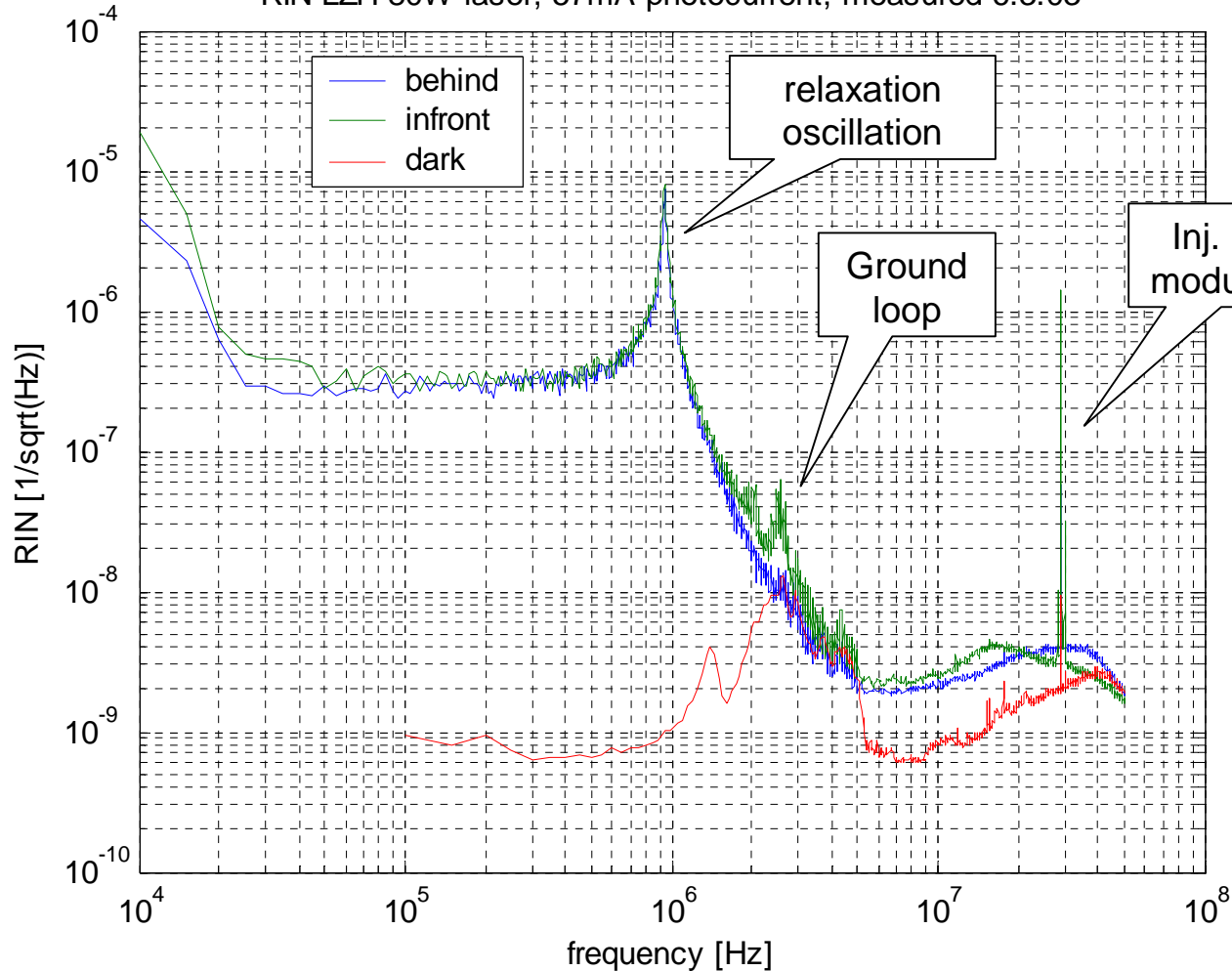


RIN LZH 80W laser, 57mA photocurrent, measured 6.3.03



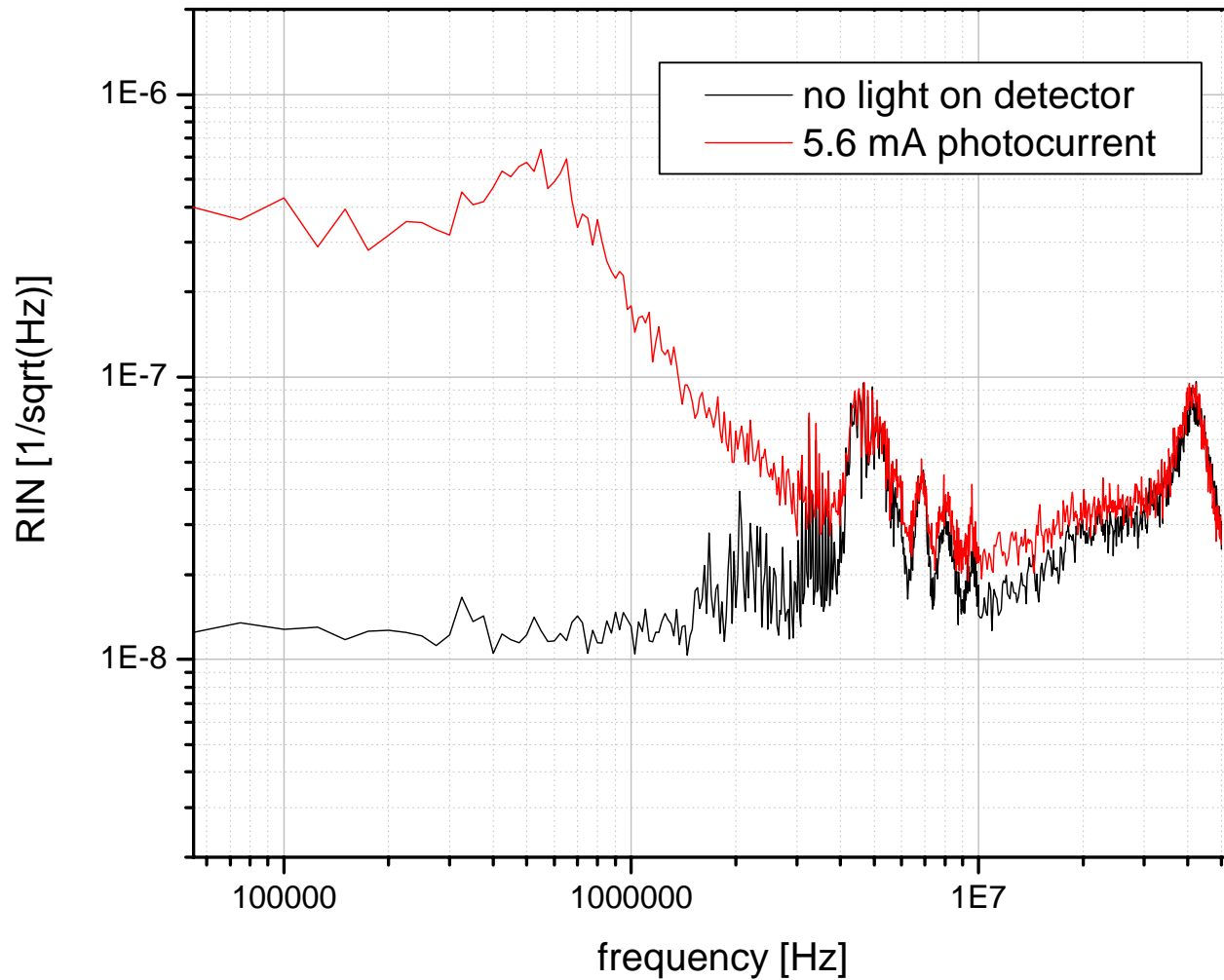


RIN LZH 80W laser, 57mA photocurrent, measured 6.3.03





Stanford MOPA system, measured 15.03.03





	oscillator LZH	MOPA (Stanford)
output power	80W	65W
power fluctuations (over 10s)		
- after modecleaner	19%	7%
- before modecleaner	14%	2%
fluctuations between power in higher order modes	low	high

