

A wide-angle photograph of a coastal promenade. In the foreground, a paved walkway runs along a stone breakwater. A person in a dark jacket is walking on the left. A metal railing is visible in the lower-left corner. The breakwater is composed of large, light-colored stones. Beyond the breakwater is the blue sea. In the background, a city with various buildings is visible on a hillside under a clear blue sky. The text "LMA Mirrors and beyond" is overlaid in the center in a white serif font.

# LMA Mirrors and beyond

# Cavity Parameters

Free spectral Range  $\longrightarrow FSR = \frac{c}{4L}$  20.83 MHz

Finesse  $\longrightarrow \mathcal{F} = \pi \frac{1-A}{1-(1-A)^2}$

$A = 10 \text{ ppm} \rightarrow \mathcal{F} = 1.57 * 10^5$

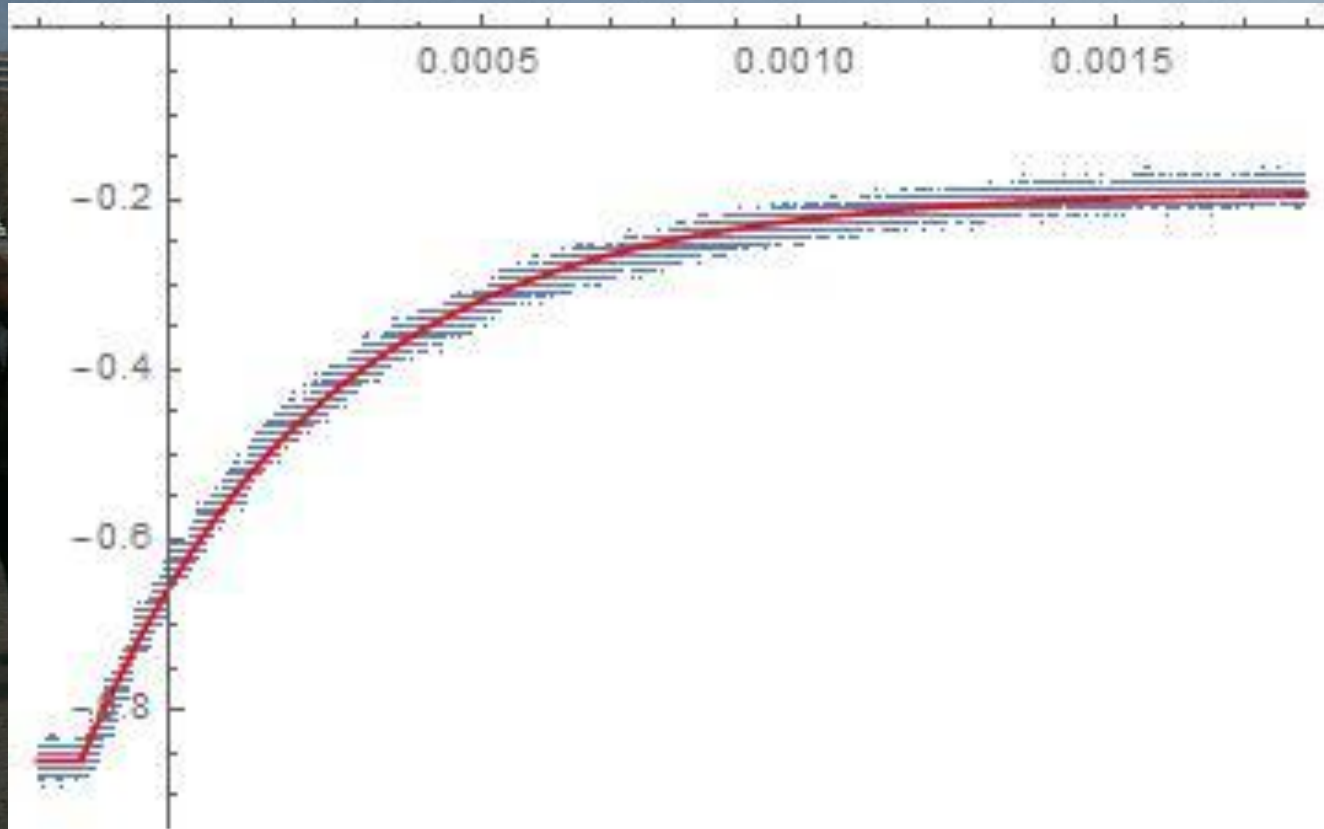
$A = 30 \text{ ppm} \rightarrow \mathcal{F} = 5 * 10^4$

FWHM

$\longrightarrow FSR/\mathcal{F}$

# Measured cavity decay times

$$I(t) = I_0 \Theta(\tau_0 - t) + I_0 \Theta(t - \tau_0) e^{-\frac{t-\tau_0}{\tau}} + I_\infty$$

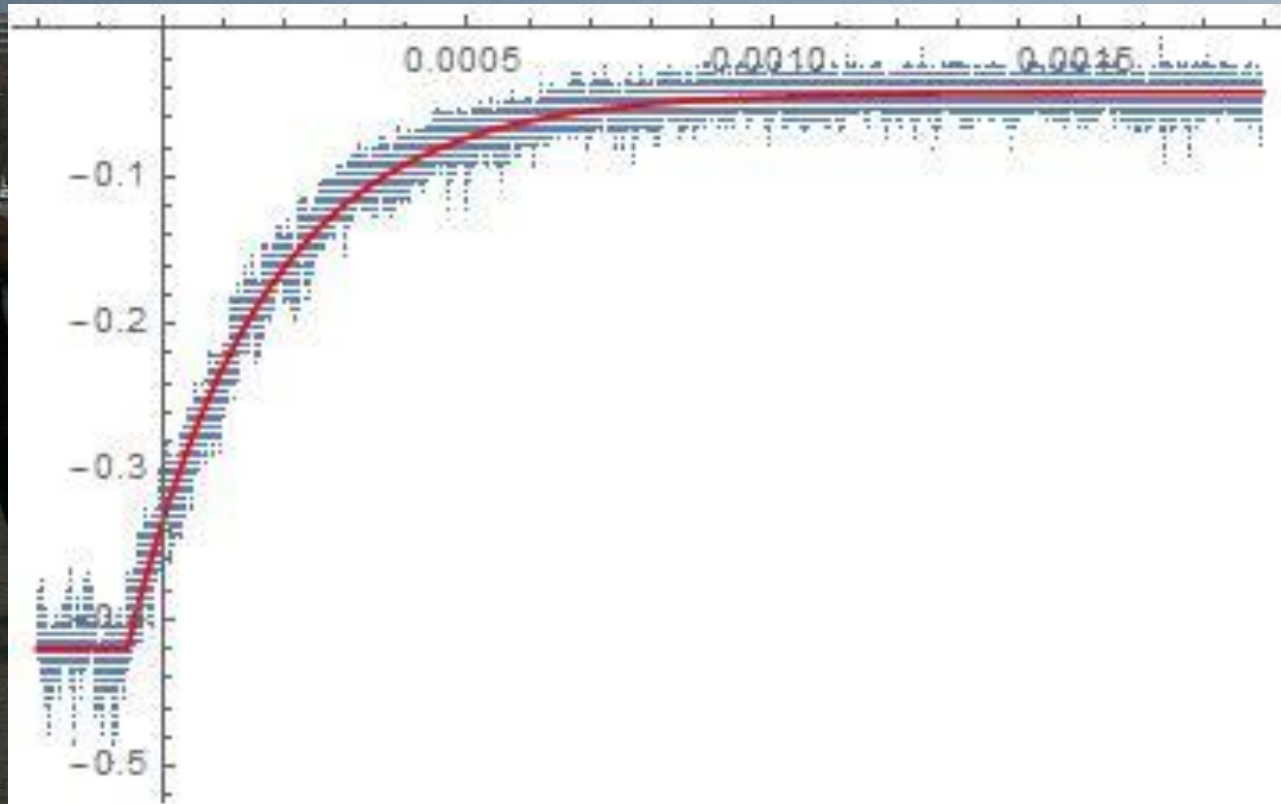


	<i>Estimate</i>	<i>Error</i>
$I_0$	-0.6705	0.0002
$I_\infty$	-0.18949	0.00006
$\tau_0$	-0.0001362	$1 \cdot 10^{-7}$
$\tau$	0.0003829	$2 \cdot 10^{-7}$
A	0.000031	
$\mathcal{F}$	50126	

$(1-R)^2$ 

# Measured cavity decay times

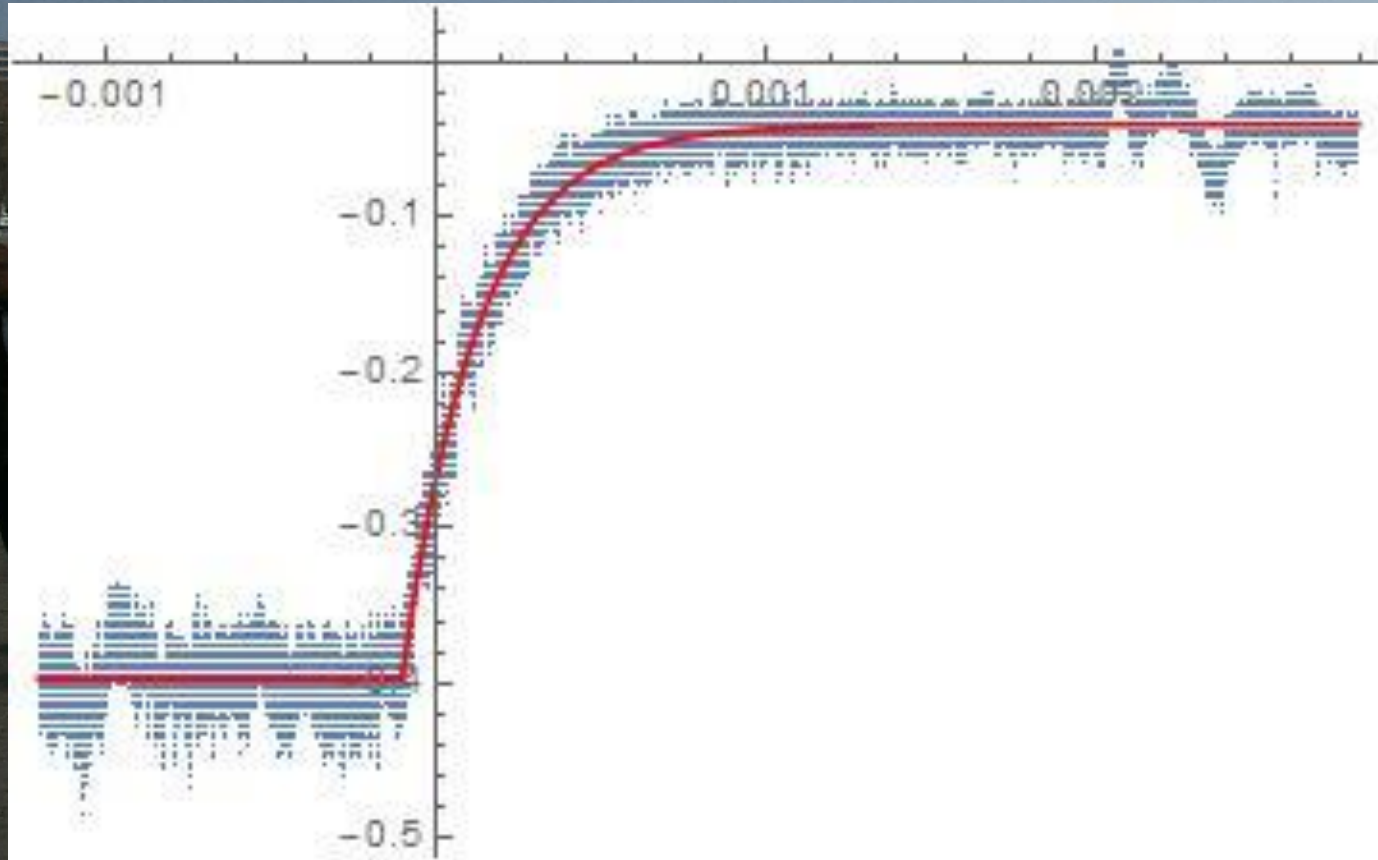
$$I(t) = I_0 \Theta(\tau_0 - t) + I_0 \Theta(t - \tau_0) e^{-\frac{t-\tau_0}{\tau}} + I_\infty$$



	<i>Estimate</i>	<i>Error</i>
$I_0$	-0.3778	0.0001
$I_\infty$	-0.0425	0.0001
$\tau_0$	-0.0000565	$1 \cdot 10^{-7}$
$\tau$	0.0002221	$2 \cdot 10^{-7}$
A	0.000054	
$\mathcal{F}$	29080	

# Measured cavity decay times

$$I(t) = I_0 \Theta(\tau_0 - t) + I_0 \Theta(t - \tau_0) e^{-\frac{t-\tau_0}{\tau}} + I_\infty$$



	<i>Estimate</i>	<i>Error</i>
$I_0$	-0.3566	0.0001
$I_\infty$	-0.0404	0.0001
$\tau_0$	-0.0001027	$1 \cdot 10^{-7}$
$\tau$	0.00022272	$2 \cdot 10^{-7}$
A	0.000053	
$\mathcal{F}$	29700	

Reference	Average scattering ( $\varnothing$ 12 mm) at 633 nm, 45° inc.	Average scattering ( $\varnothing$ 6 mm) at 633 nm, 45° inc.
S14095+S14096 N°1	15 ppm	3.5 ppm
S14095+S14096 N°2	14 ppm	13 ppm
S14095+S14096 N°3	4 ppm	3.4 ppm
S14095+S14096 N°4	8.5 ppm	8 ppm
S14095+S14096 N°5	6 ppm	6 ppm
S14095+S14096 N°6	13 ppm	13 ppm
S14095+S14096 N°7	12 ppm	3 ppm
S14095+S14096 N°8	3.2 ppm	2.5 ppm
S14095+S14096 N°9	15 ppm	10 ppm

Reference	Average scattering ( $\varnothing$ 12 mm) at 633 nm, 45° inc.	Average scattering ( $\varnothing$ 6 mm) at 633 nm, 45° inc.
S14095+S14096 N°10	7 ppm	5.5 ppm
S14095+S14096 N°11	9 ppm	9 ppm
S14095+S14096 N°12	16 ppm	16 ppm
S14095+S14096 N°13	3.5 ppm	2.3 ppm
S14095+S14096 N°14	8 ppm	8 ppm
S14095+S14096 N°15	6 ppm	6 ppm
S14095+S14096 N°16	8 ppm	8 ppm

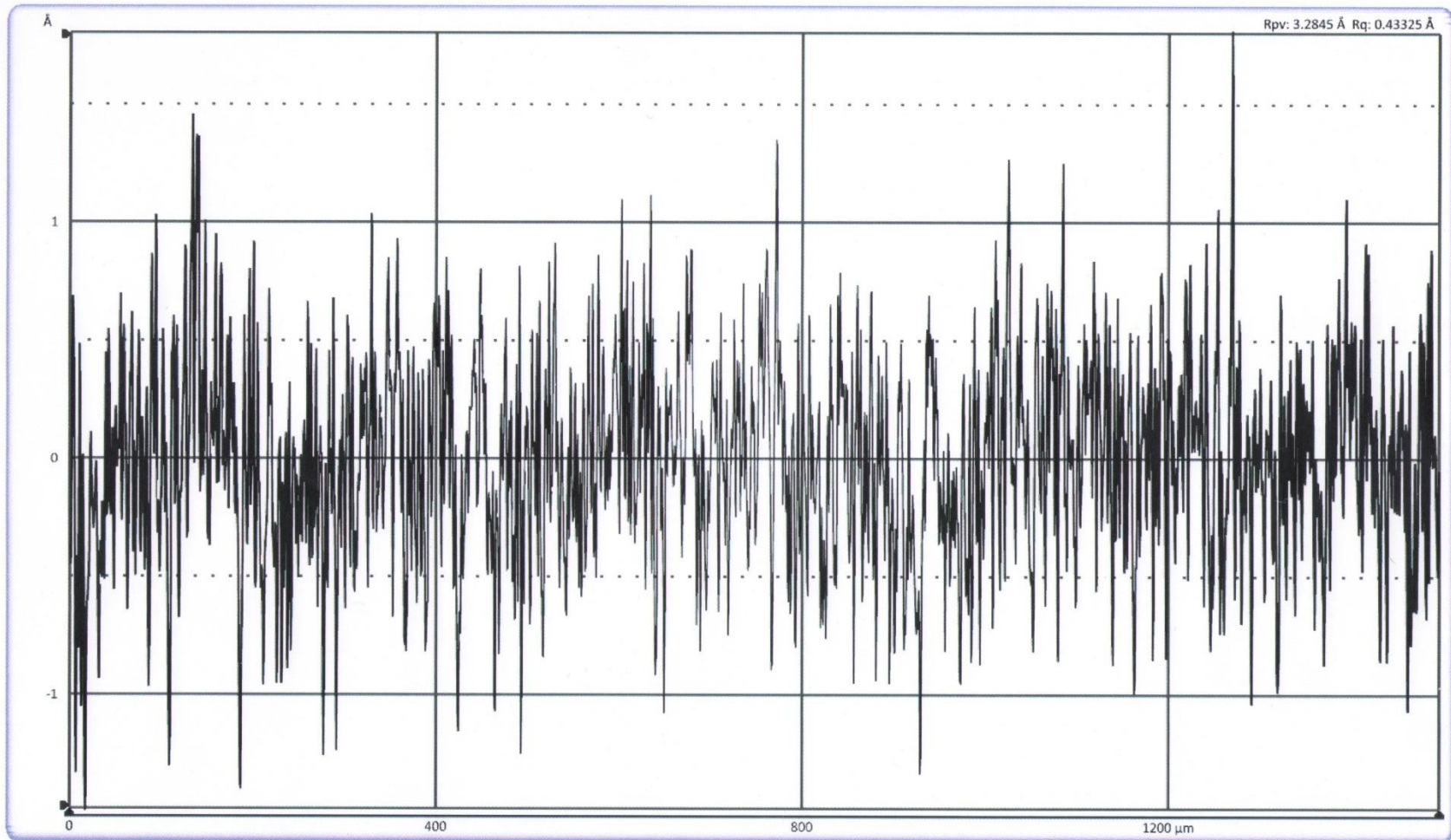
Transmission at 633 nm, 45° inc., polarization S : **1-1.5 ppm**

Transmission at 633 nm at normal incidence (measurement done at 1° of incidence) : **70 ppm**

Reflexion AR coating at 45°, polarization S : **4000 ppm**

Reflexion AR coating at normal incidence (measurement done at 3° of incidence) : **130 ppm**

Absorption HR coating at 45°, polarization S : **< 3 ppm**



Stats				
Operator	Comments	S/N:	System	PV
Arlene Kistner, Gooch & Housego	PR-01128	#1 S-1	Zygo Zemapper	3.2845 Å
RMS	FFT Type	FFT High Per	FFT High Freq	
0.43325 Å	High Pass	373.95 µm	0.00267 cycles/µm	

Zometrics – ZeMaps Version 1.16.23 – 12/12/2013 8:37 AM

