

# New laser handling procedures

& other controls

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# Cleanliness

- Problem: cleanliness
- Causes: People & entropy



# Proposals

- > New handling controls (primarily for laser group & respons.)
- > Laser hutch (1K05)
  - Install stick mat by shaft, peel mats weekly
  - Booties **and** labcoats to be worn
    - Install coat hooks in vorraum and shaft.
  - **If** touching optics, optomechanics, laser table **then** gloves
    - Avoid touching face, hair, etc.
  - All unknown opto-mechanics considered contaminated and wiped with alcohol
  
- > Optics Lab (1L18)
  - Install sticky mat, peel weekly
  - **If** touching optics, optomechanics, laser table **then** gloves
    - Avoid touching face, hair, etc.

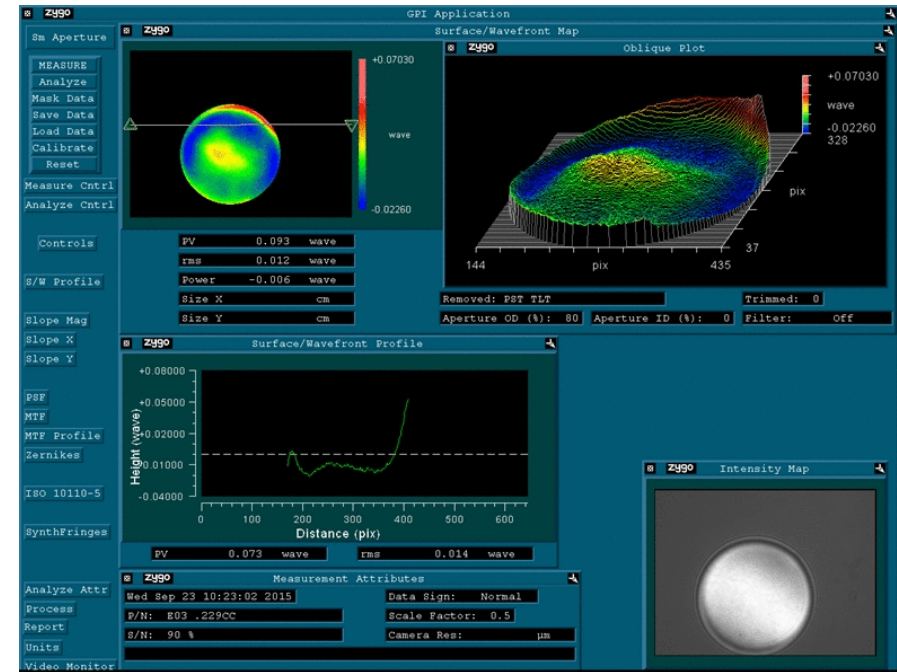
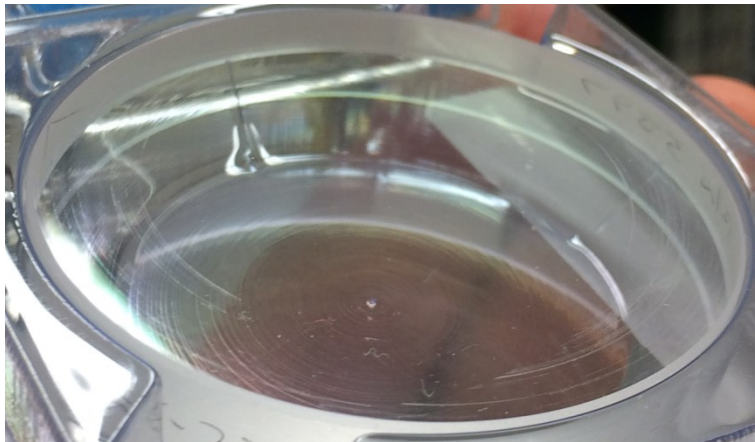


# Wavefront distortion & mechanical damage

## > Mechanical deformation from transversal mounting

Torque (oz-in) <sup>a</sup>	Push-Out Force (lb) <sup>b</sup>	Wavefront Distortion (Peak to Valley) <sup>c</sup> (Click for Example Zygo Screenshot)
4.5	>12	<a href="#">0.072λ to 0.093λ</a>
5		<a href="#">0.047λ to 0.090λ</a>
5.5		<a href="#">0.057λ to 0.097λ</a>
6		<a href="#">0.085λ to 0.103λ</a>
6.5		<a href="#">0.057λ to 0.073λ</a>
7		<a href="#">0.059λ to 0.067λ</a>
7.5		<a href="#">0.083λ to 0.092λ</a>
8		<a href="#">0.128λ to 0.145λ</a>
8.5		<a href="#">0.102λ to 0.117λ</a>
9		<a href="#">0.141λ to 0.162λ</a>
10	<a href="#">0.188λ to 0.224λ</a>	

## > Mechanical coating damage



Thorlabs K1S4 3-7 cN.M mounting torque interferograms



# Proposals

## ➤ Defined torque limits for optomechanics

Size	Flexure arm	SM1-threaded	Type	
Ø1/2"	4.2-7.0 (5.6)	4.2-14.0 (9.1)		6mm thick optic
Ø1"	3.5-5.0 (4.3)	3.5-17.0 (10.3)		"
Ø2"	2.8-4.2 (3.5)	7.0-17.0 (12)		12mm thick optic

### ▪ Rule-of-thumb:

Locking screw: 4.2 cN.m

SM1-thread: 10.3 cN.m



## ➤ Consider glue-in optomechanics for future critical surfaces

