

OPTOMAN

YOUR SIDEKICK FOR
LASER OPTICS DEVELOPMENT

EPIC Online Technology Meeting on Challenges for Laser Optics

Optics for big and scary fs/ps lasers



Remigijus Šliupas
Co-founder and CEO @ OPTOMAN
2021 April 12th



Highly customized and application-optimized laser optics for **extreme power** and **ultrafast lasers** with ultrafast turnaround.

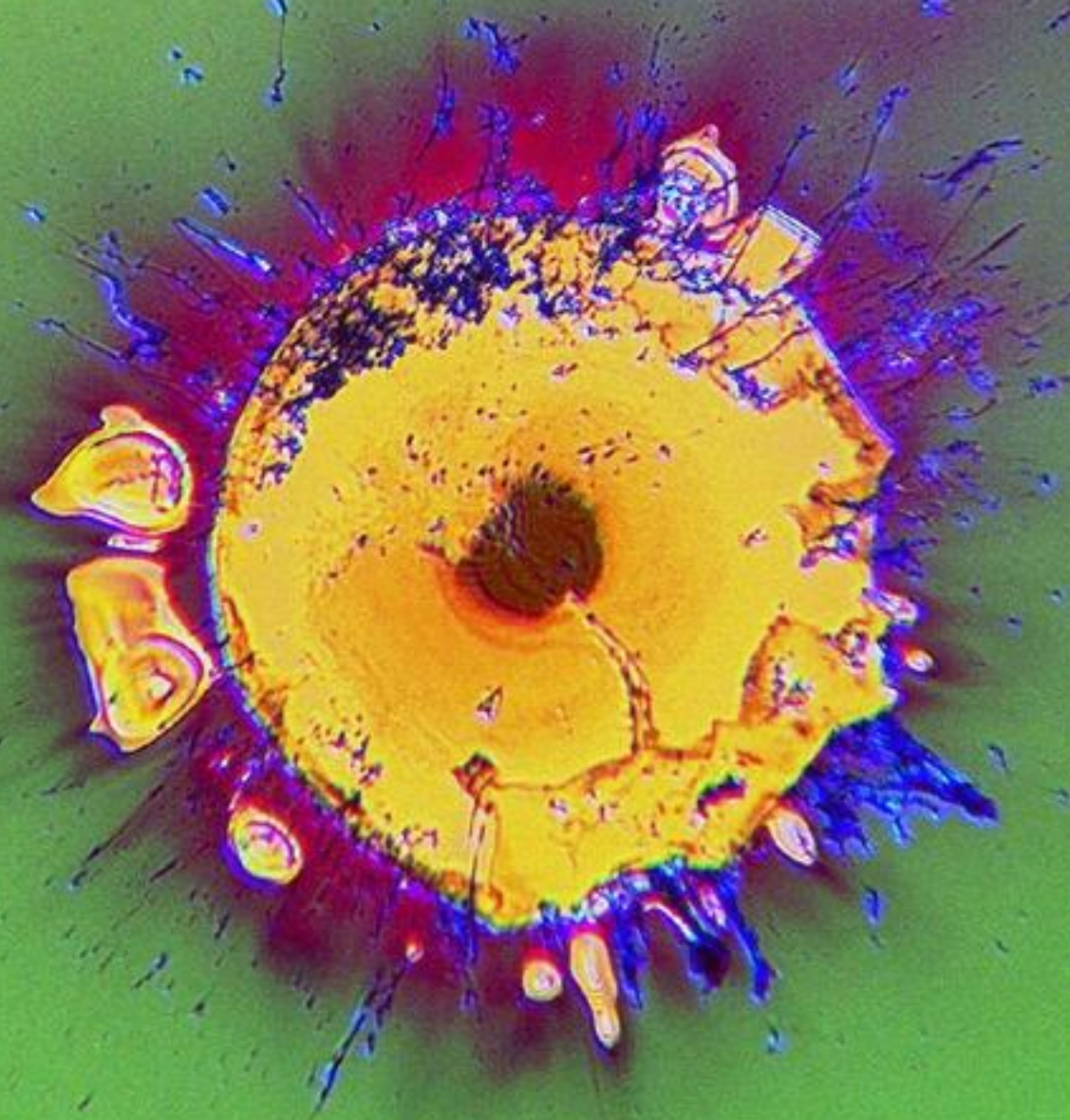
Concentration on a **single** manufacturing technology – **IBS**





Challenges for Laser Optics

Uncle Ben said once
**WITH A GREAT LASER POWER COMES
A GREAT RESPONSIBILITY FOR COATERS**



A laser is only as strong as its weakest link.

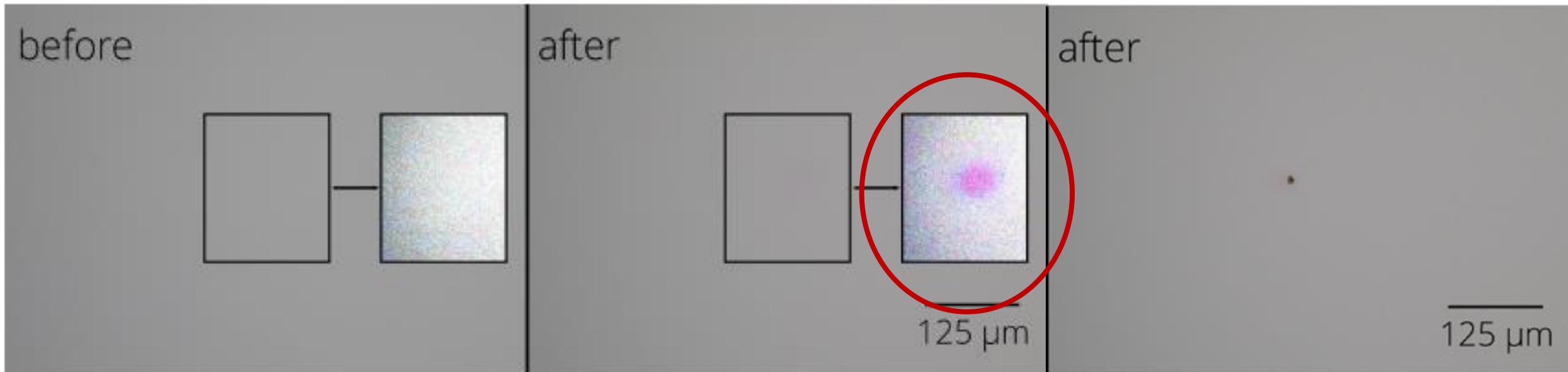
Specific topic addressed – degradation

HR@1030 nm mirrors

Clean surface

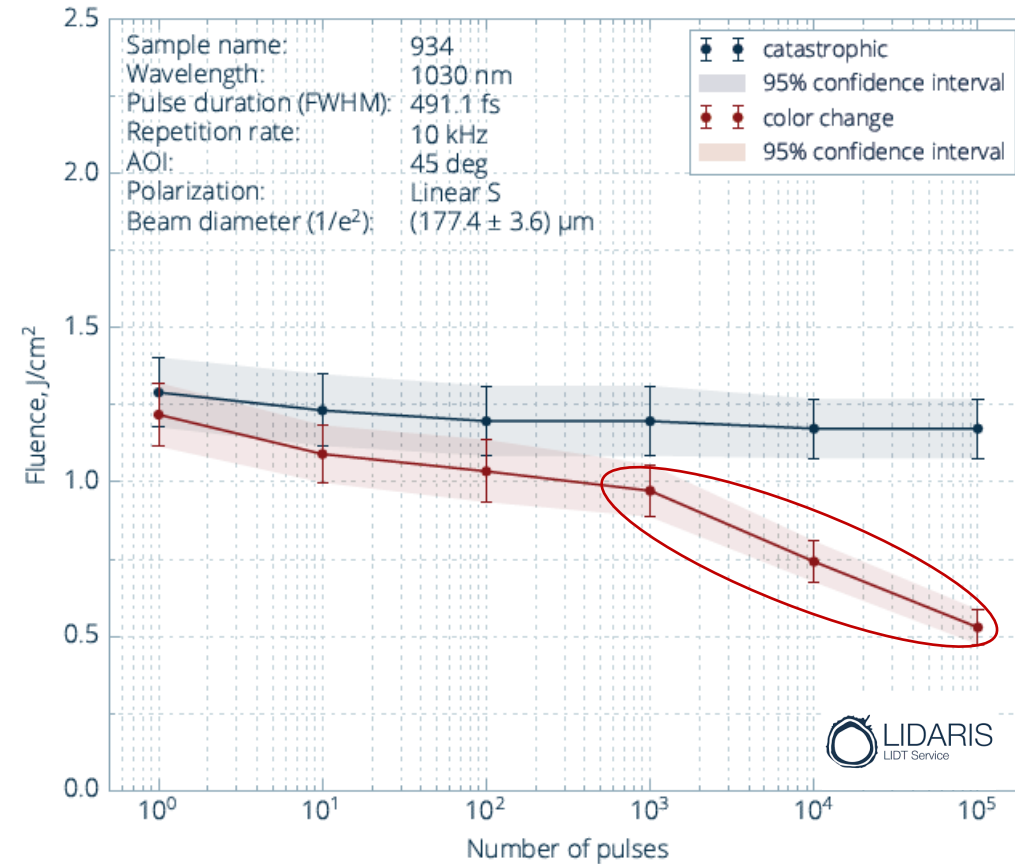
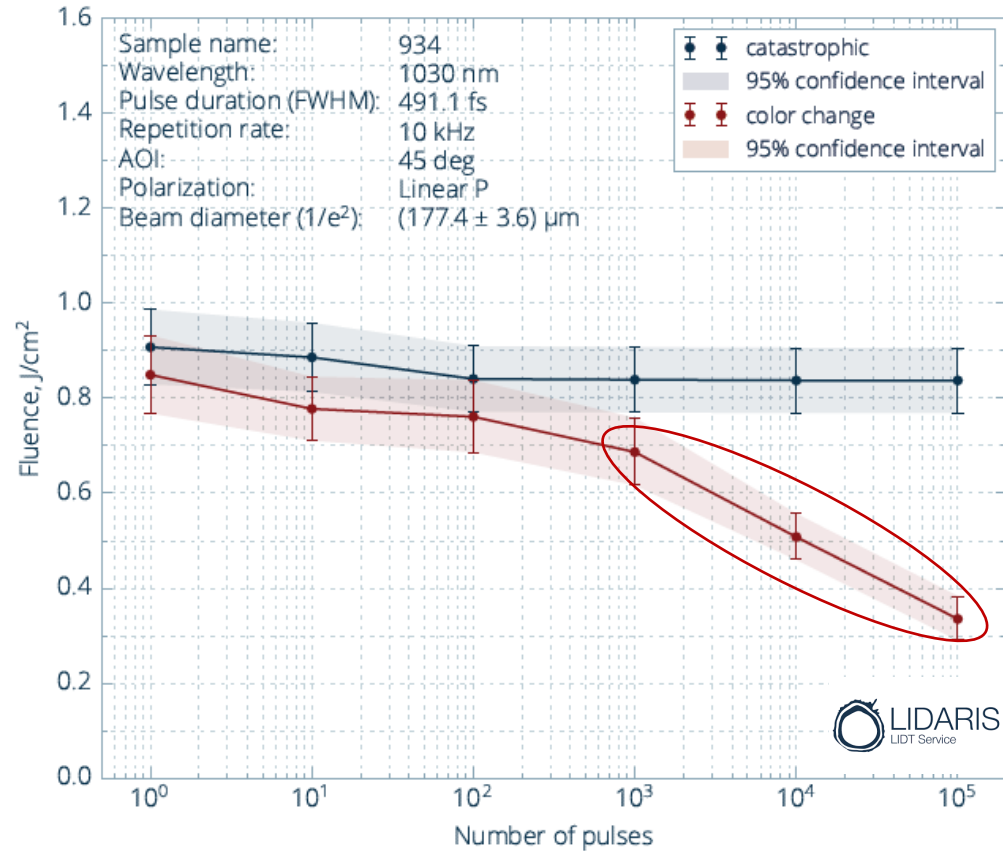
Color change - degradation

Catastrophic damage



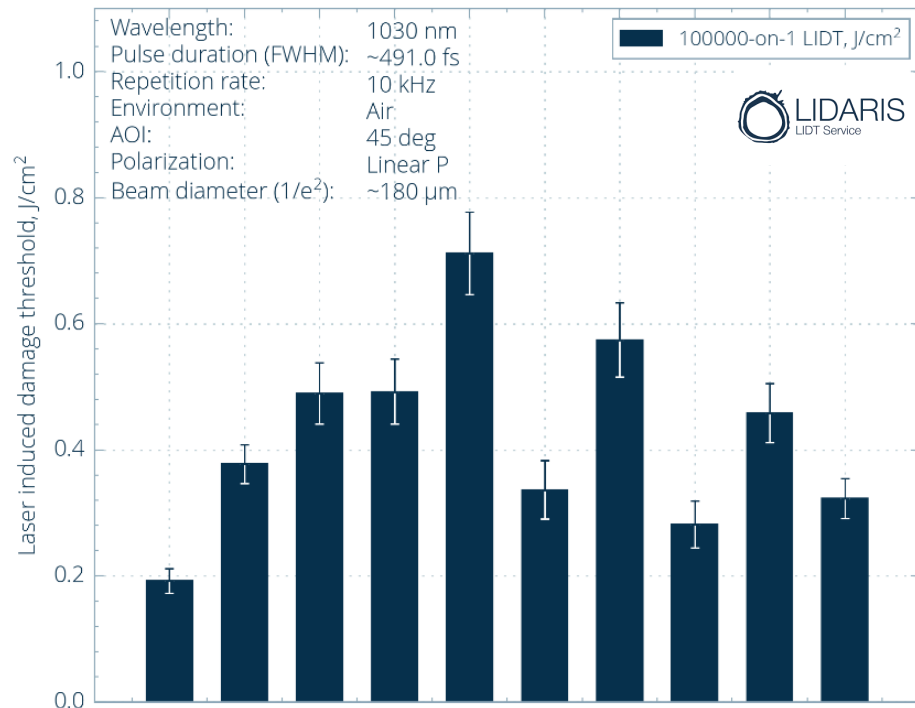
Specific topic addressed – degradation

We have to get rid of these bad and ugly tails!



Brutal Research and Development by Dr. Simonas Kičas and the team

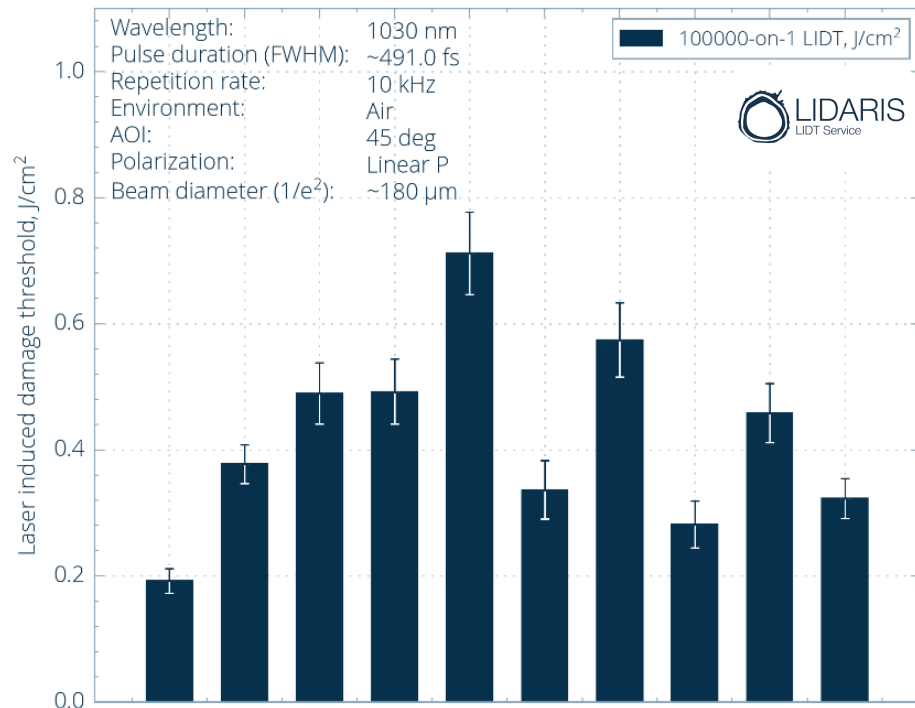
Stage #1 Private LIDT competition



Brutal Research and Development by Dr. Simonas Kičas and the team

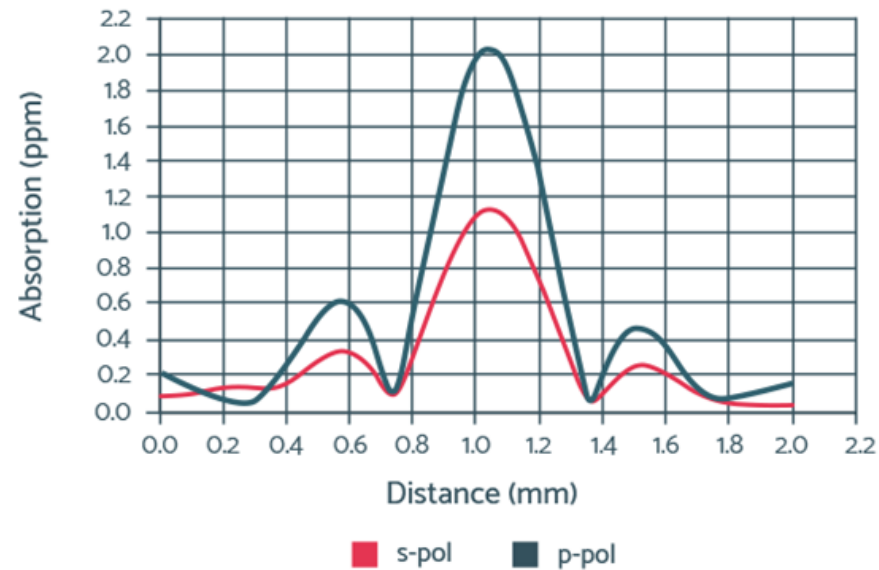
Stage #1

Private LIDT competition



Stage #2

Reduce absorption down to <1 ppm @ 1064 nm

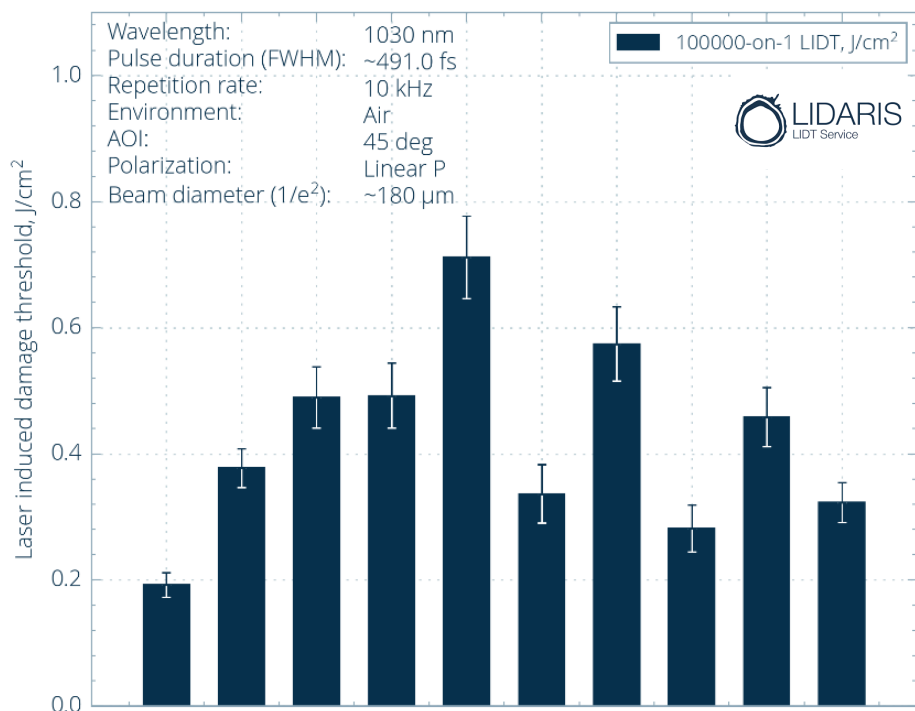


Record low: <0.12 ppm @ 1064 nm

Brutal Research and Development by Dr. Simonas Kičas and the team

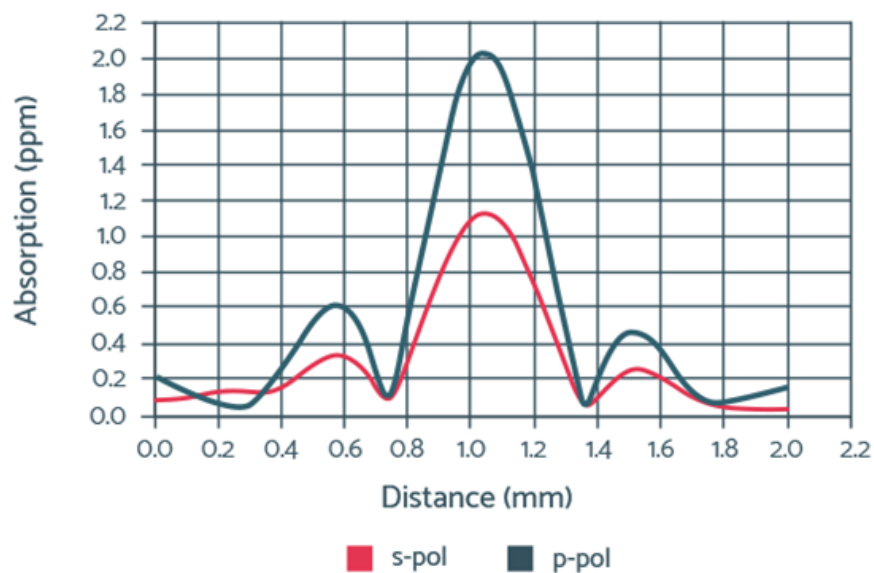
Stage #1

Private LIDT competition



Stage #2

Reduce absorption down to <1 ppm @ 1064 nm



Stage #3

Some confidential magic



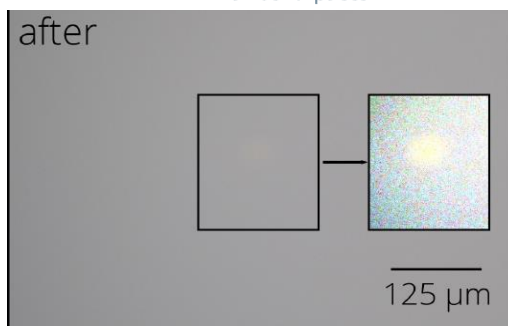
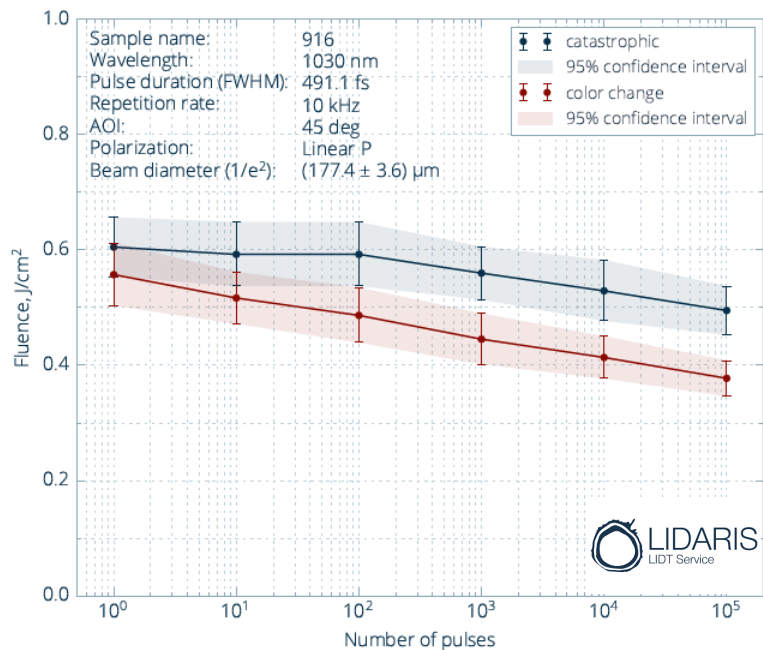
Record low: <0.12 ppm @ 1064 nm

Outcome:

Degradation free HR mirrors for fs applications

Round # 1

Degradation is still there.

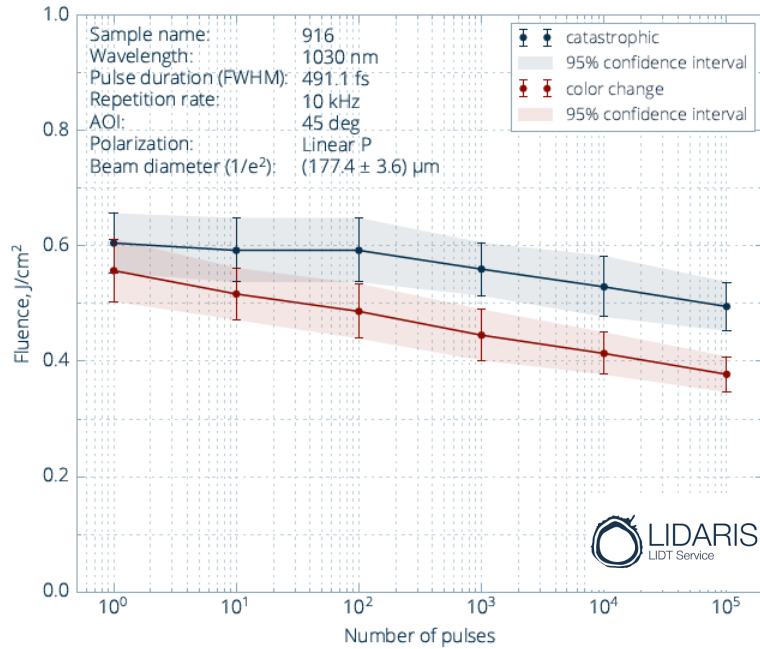


Outcome:

Degradation free HR mirrors for fs applications

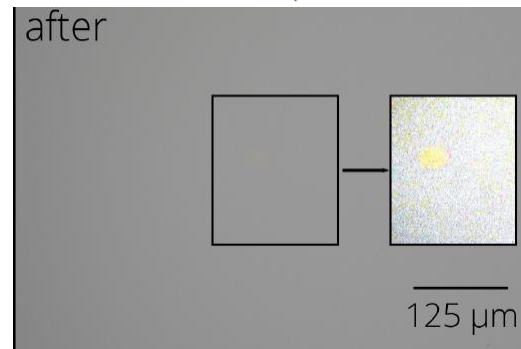
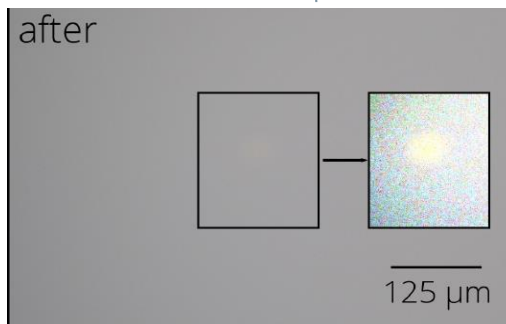
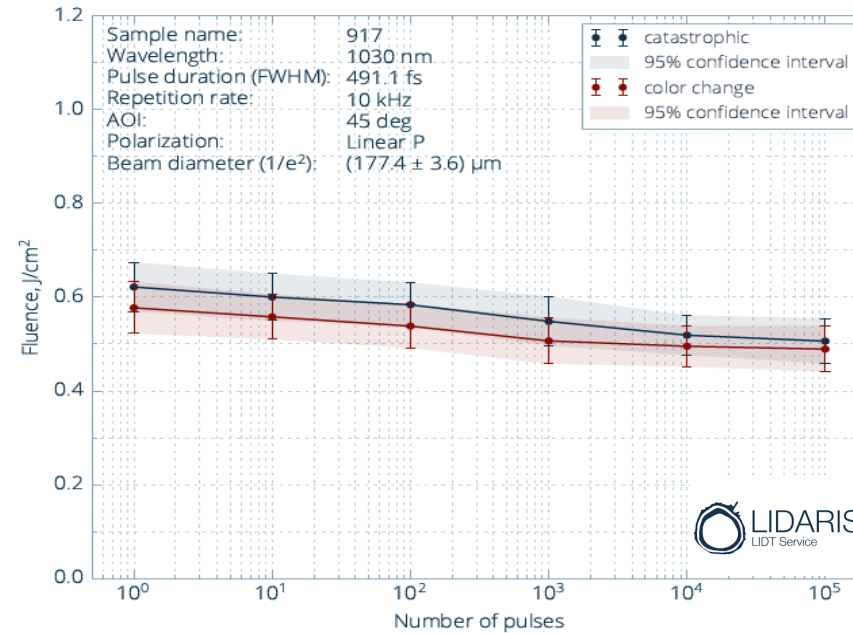
Round # 1

Degradation is still there.



Round # 2

Looks promising.

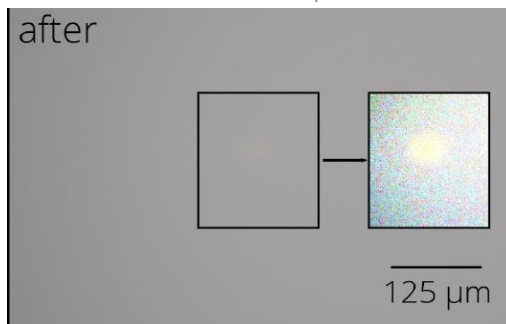
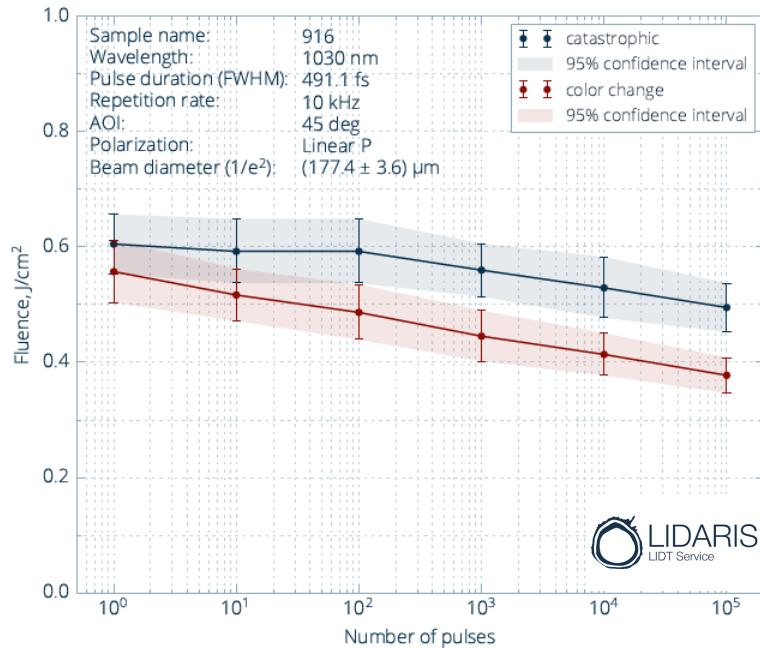


Outcome:

Degradation free HR mirrors for fs applications

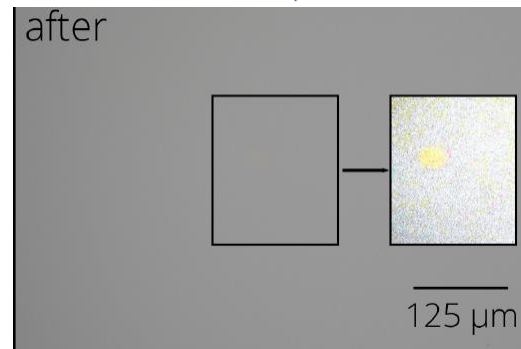
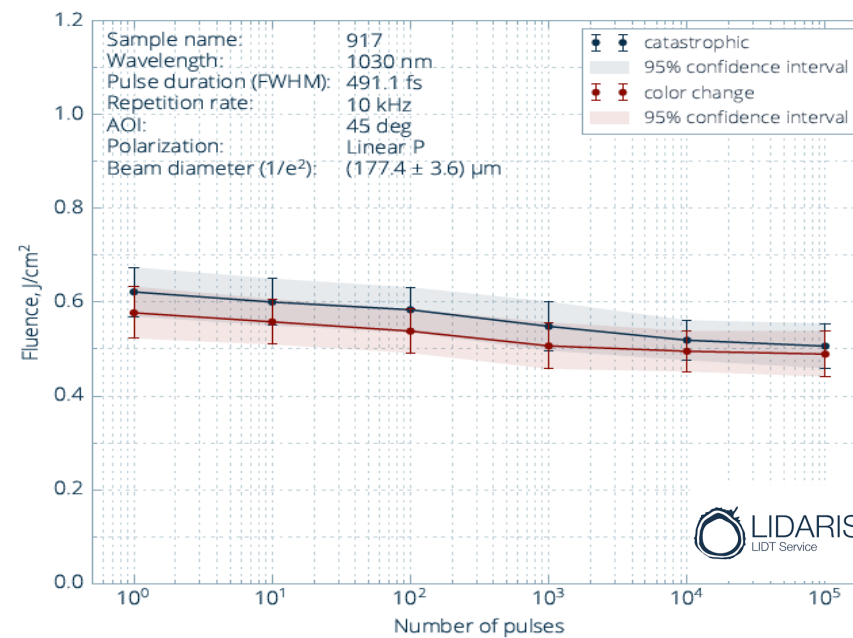
Round # 1

Degradation is still there.



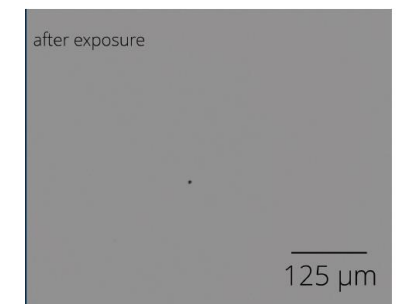
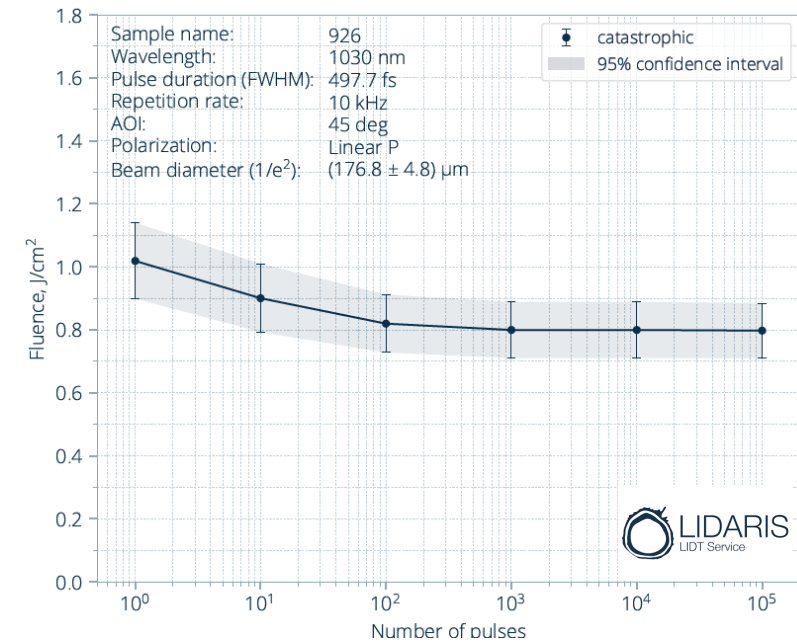
Round # 2

Looks promising.



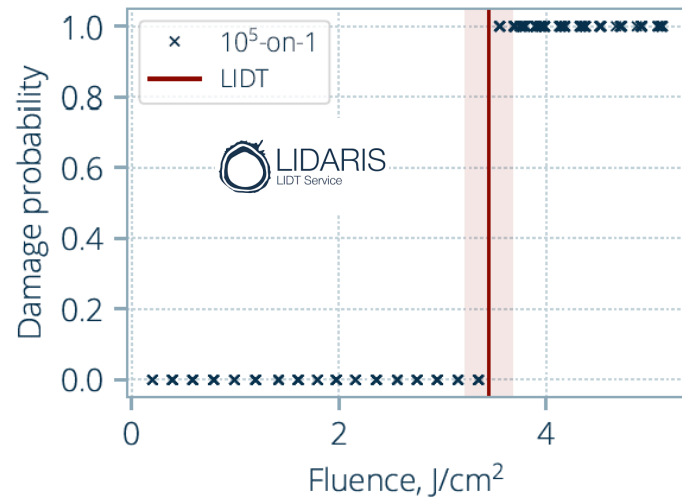
Round # 3

No degradation.
 Just pure catastrophic damage.

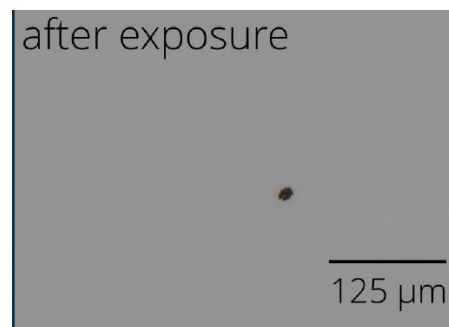
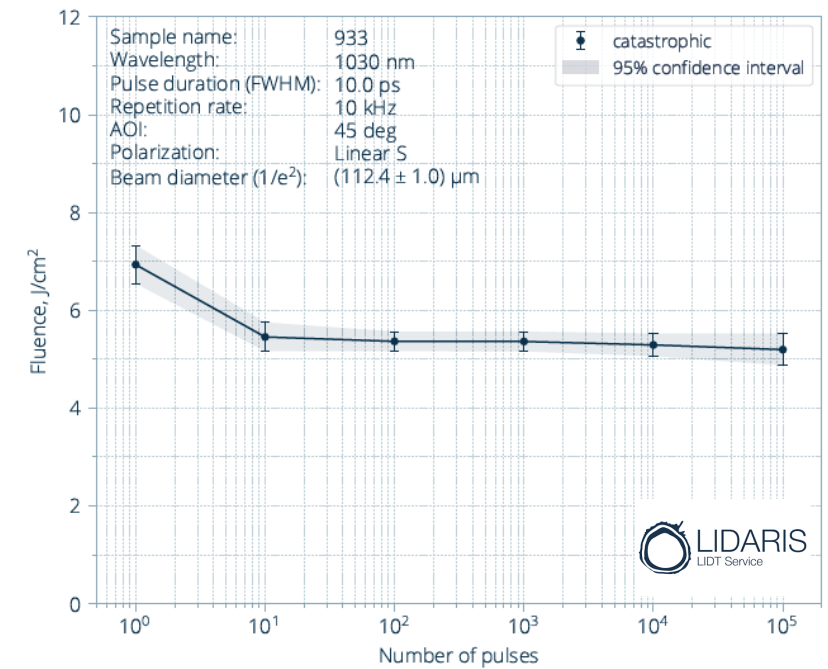
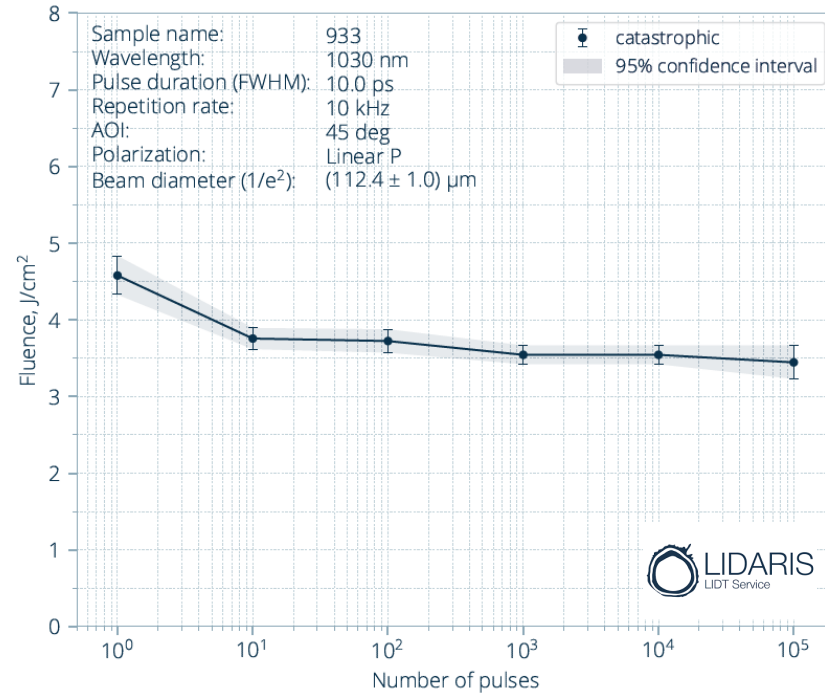


Degradation free mirrors for picosecond applications

Different optimal coating approach if pulse width is >5 ps



(f) 10⁵-on-1



“What can you do for us?”

1. Help to understand if these results are relatively high, low, normal.
2. (Dis)qualify/approve such kind of optics in working high power laser systems. Larger area testing.

“What can we do for you?”

1. Design, develop and manufacture highly customized and application optimized laser optics for extreme power applications.

