This project has received funding from the European Union's Horizon 2020 Research and Innovation programme under GA No 101004730.

Task 9.5: Improvement of mechanical and superconducting properties of RF resonator by laser radiation.

Arturs Medvids

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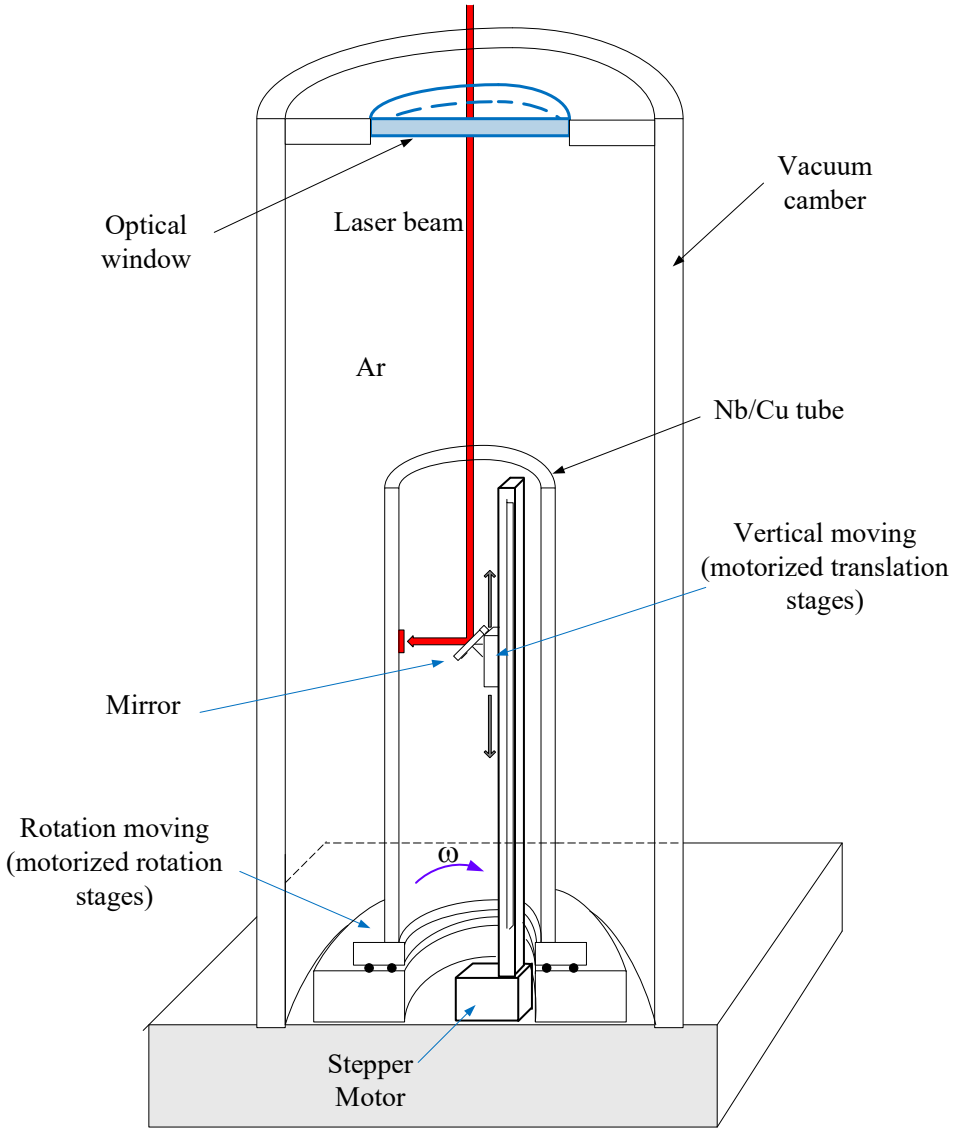
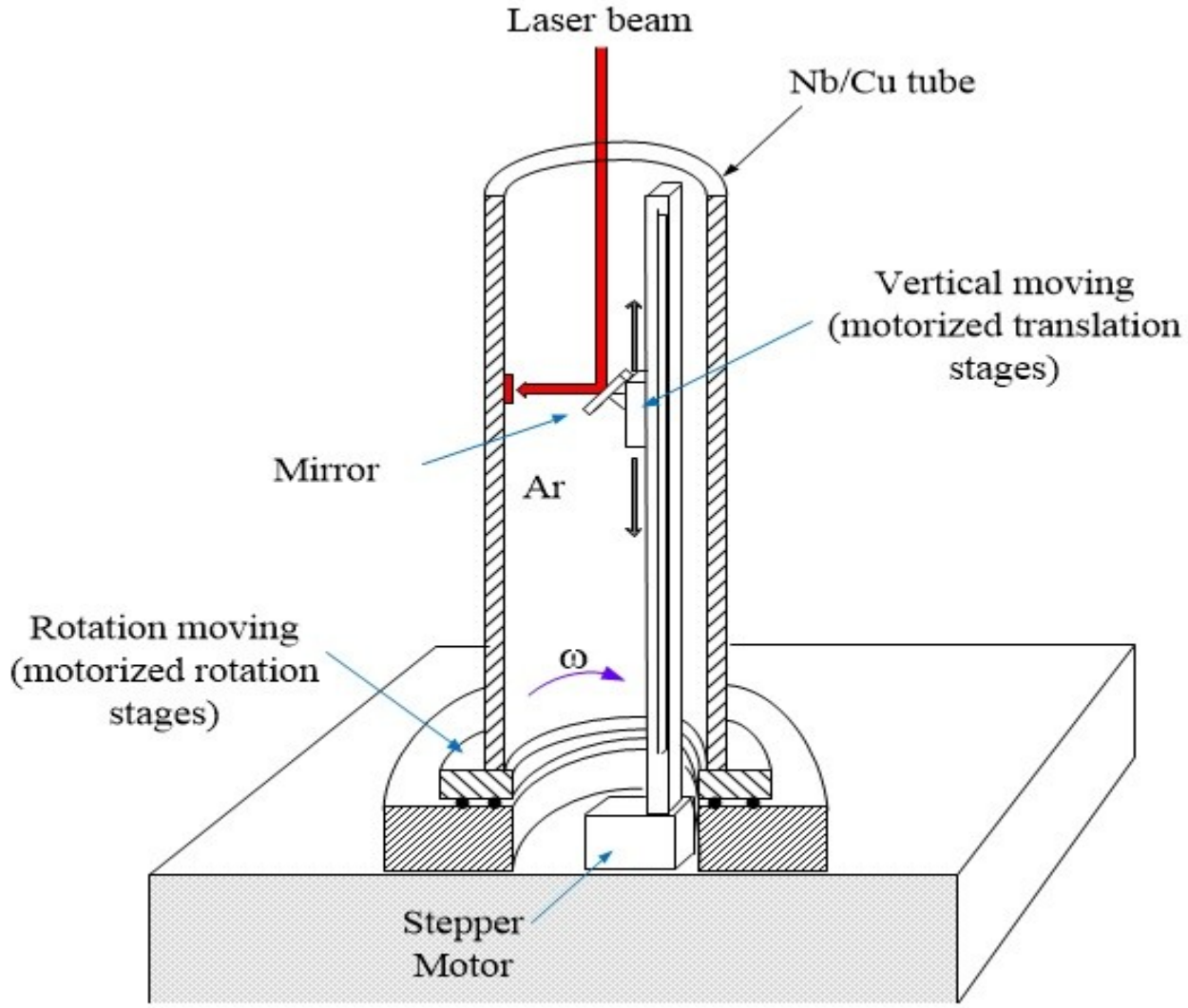
iFAST

15.11.2021.


Optical window
Laser beam
Vacuum camber
Ar
Nb/Cu tube
Vertical moving (motorized translation stages)
Mirror
Rotation moving (motorized rotation stages)
ω
Stepper Motor

Cross-section of the laser facility for irradiation inner surface of RF cavity



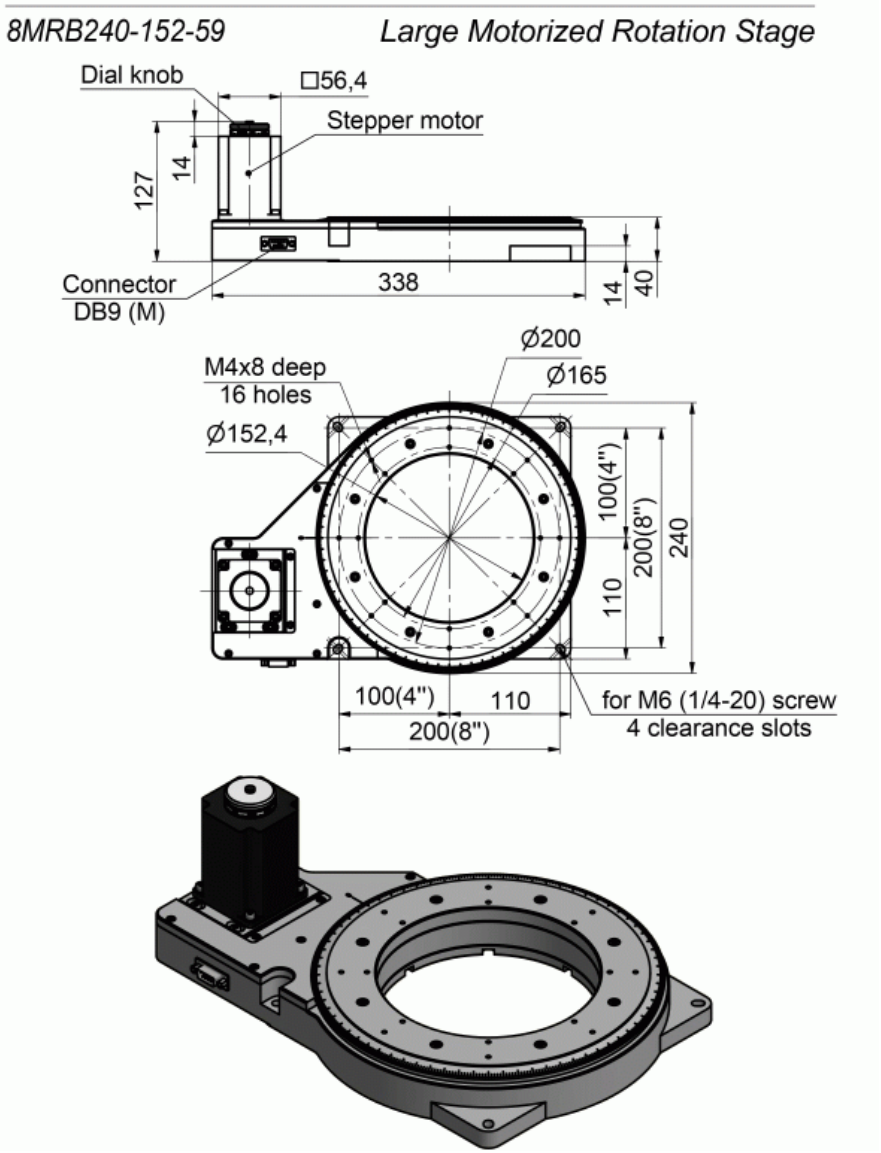
Now we are making a vacuum chamber with an optical window.
And we wait for the results of the purchase competition of two motors for the chamber: stepper motor and motorized rotation stage.

Laser facility:

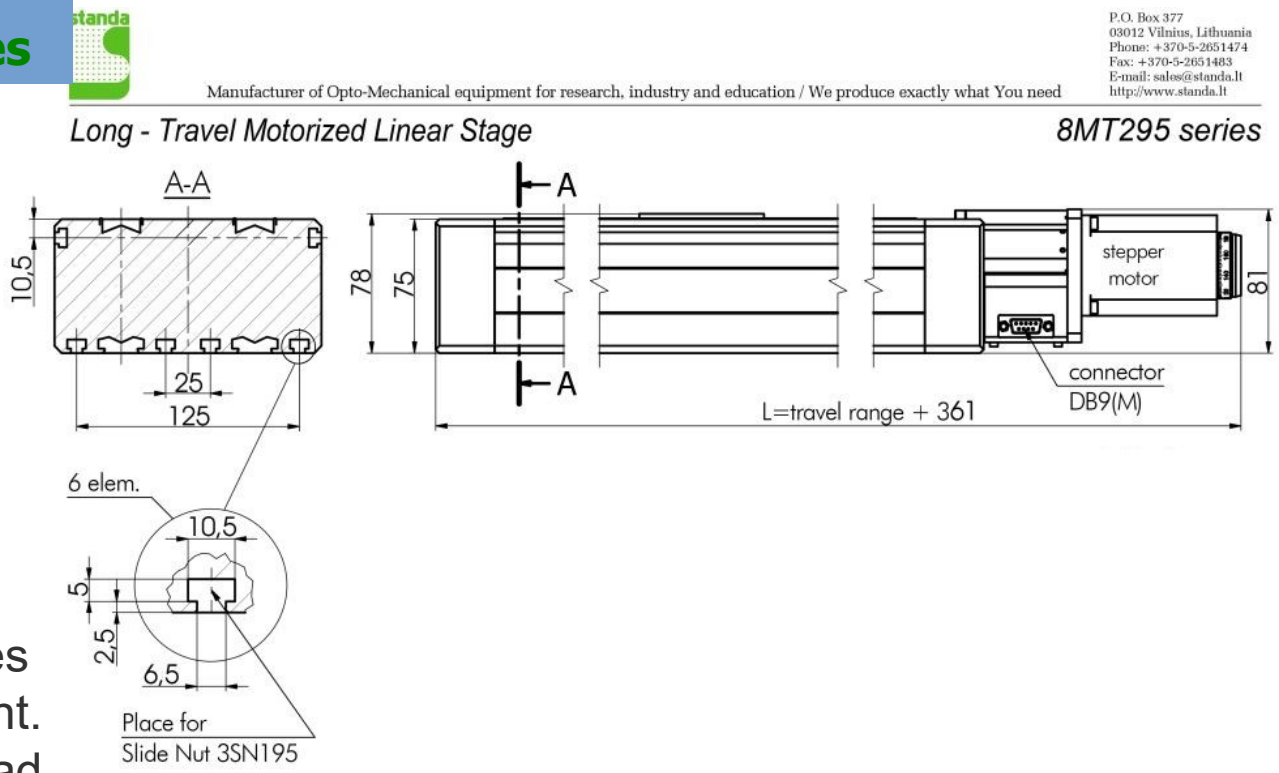
L=450mm, D=250mm, Ar gas atmosphere 1.5 atm pressure.

8MRB240-152-59 - Large Motorized Rotation Stage

This rotator is a perfect example of our personal approach with clients and custom design flexibility. The device was designed in cooperation with microchip manufacturing company for operations with silicon wafers.



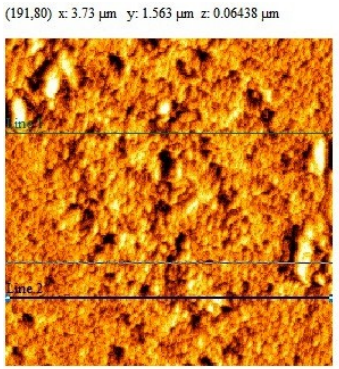
8MT295 - Long-Travel Motorized Linear Stages

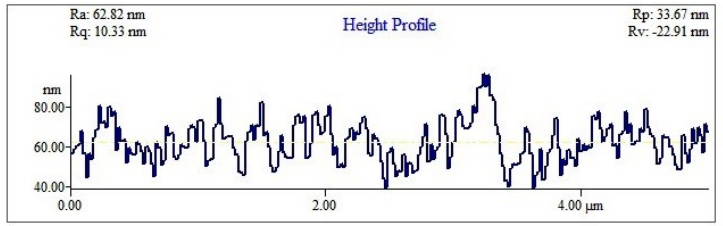


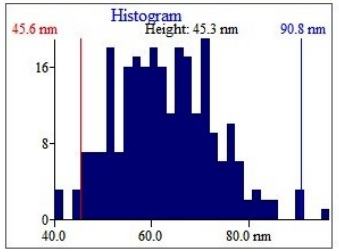
Long Travel Motorized Linear Stage 8MT295 series stages are designed to provide high-speed movement. Standard motors allow moving loads up to 60 kg. Load capacity can be increased using more powerful motors. This stage provides moderate resolution and accuracy. 8MT295 series stages are supplied equipped with **3P295** platform, **3BP295** bases plates (2 pc) and appropriate amount of **3SN195** inserts. Resolution and speed of 8MT295 series stages can be varied choosing appropriate ball screw pitch. Several standard options are available and should be specified upon ordering.

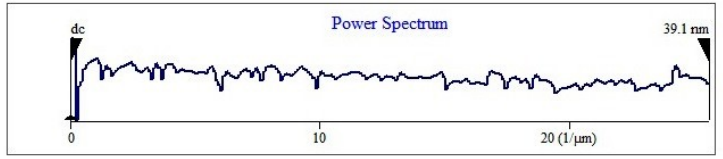
C1

Nonirradiated



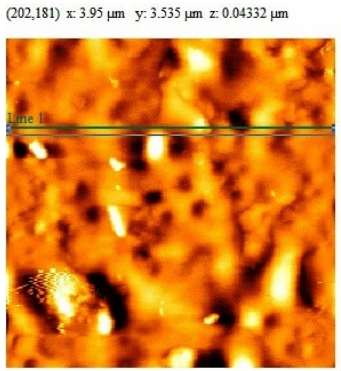


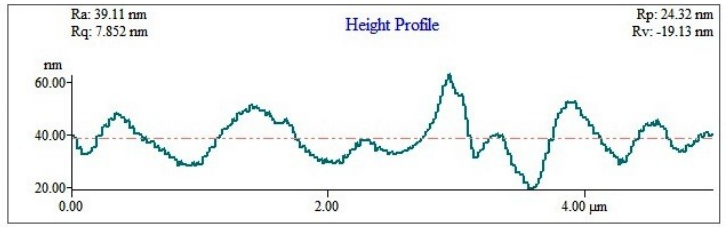


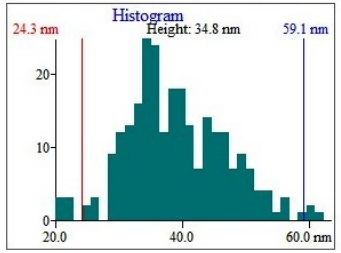


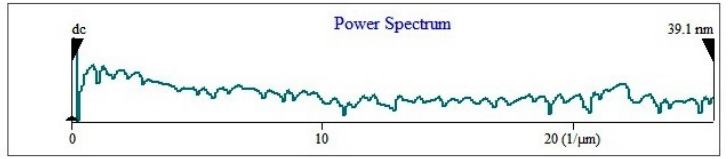
	Rp-v	Rms Rough (Rq)	Ave Rough (Ra)	Mean Ht	Median Ht	Arc length	Bearing Ratio
Line 1	55.41 nm	10.93 nm	8.856 nm	62.82 nm	63.08 nm	5.474 µm	@30.0% 69.45
Line 2	**56.58 nm**	**10.33 nm**	**8.309 nm**	**62.82 nm**	**61.74 nm**	**5.388 µm**	**@30.0% 68.00**
Delta [,]							

Irradiated





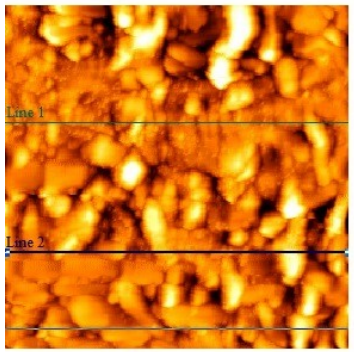


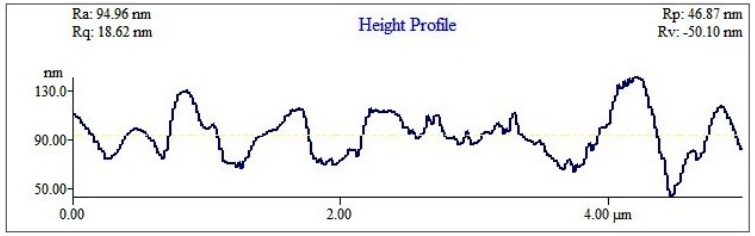


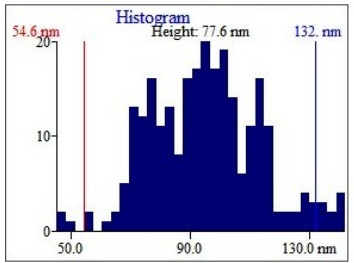
	Rp-v	Rms Rough (Rq)	Ave Rough (Ra)	Mean Ht	Median Ht	Arc length	Bearing Ratio
Line 1	**43.46 nm**	**7.852 nm**	**6.272 nm**	**39.11 nm**	**38.34 nm**	**5.145 µm**	**@30.0% 43.42**
Delta [,]							

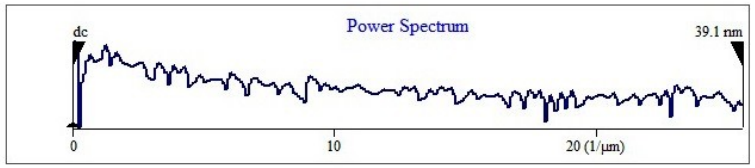
C7

Nonirradiated



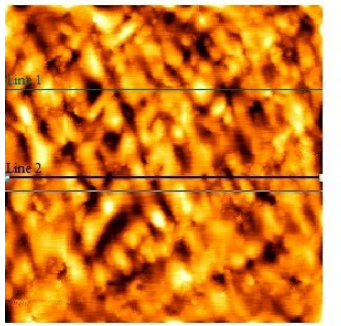


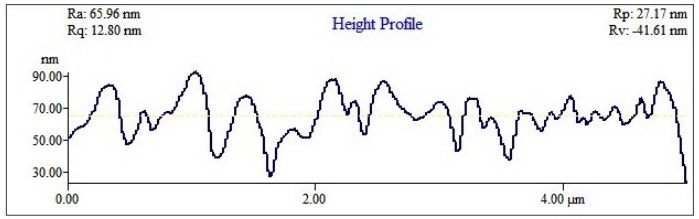


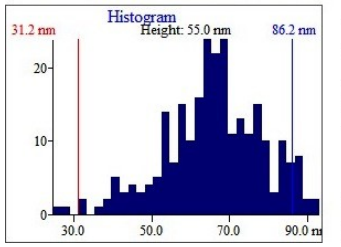


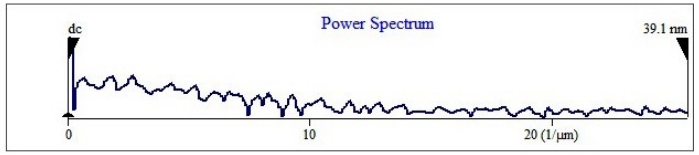
	Rp-v	Rms Rough (Rq)	Ave Rough (Ra)	Mean Ht	Median Ht	Arc length	Bearing Ratio
Line 1	77.50 nm	11.17 nm	7.904 nm	94.96 nm	95.03 nm	5.124 µm	@30.0% 99.40
Line 2	**96.98 nm**	**18.62 nm**	**14.67 nm**	**94.96 nm**	**94.59 nm**	**5.152 µm**	**@30.0% 102.87**
Delta [,]							

Irradiated





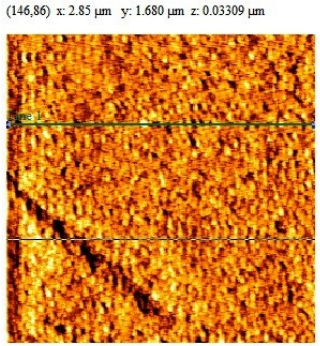


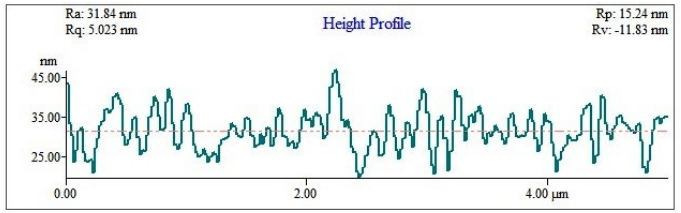


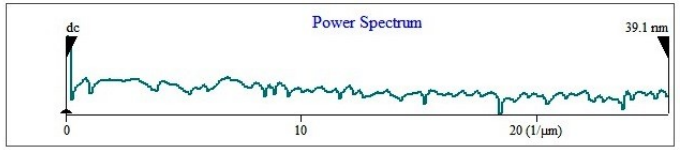
	Rp-v	Rms Rough (Rq)	Ave Rough (Ra)	Mean Ht	Median Ht	Arc length	Bearing Ratio
Line 1	95.06 nm	18.59 nm	14.22 nm	65.96 nm	67.51 nm	5.347 µm	@30.0% 75.68
Line 2	**68.78 nm**	**12.80 nm**	**9.820 nm**	**65.96 nm**	**66.36 nm**	**5.407 µm**	**@30.0% 72.67**
Delta [,]							

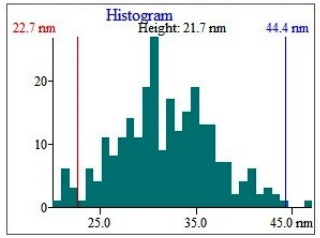
L1

Nonirradiated



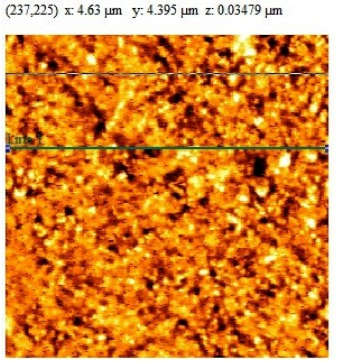


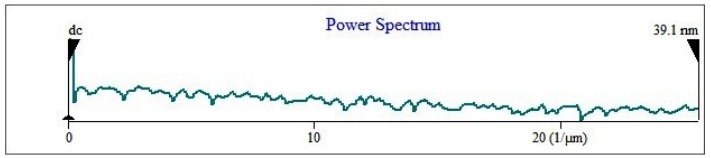


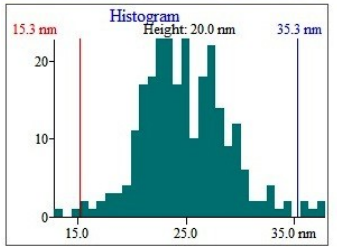


	Rp-v	Rms Rough (Rq)	Ave Rough (Ra)	Mean Ht	Median Ht	Arc length	Bearing Ratio
Line 1	27.07 nm	5.023 nm	4.008 nm	31.84 nm	31.65 nm	5.980 µm	@30.0% 34.53
Delta [.]							

Irradiated

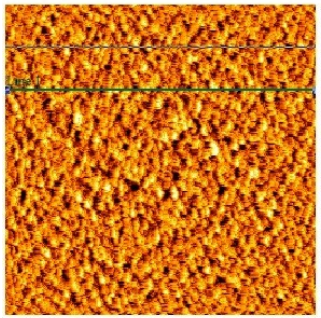


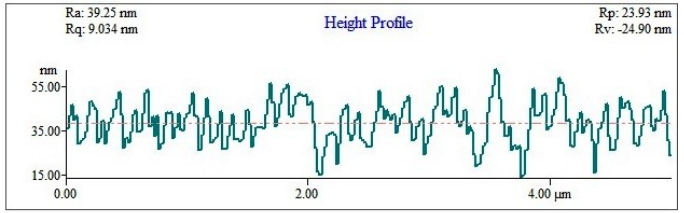


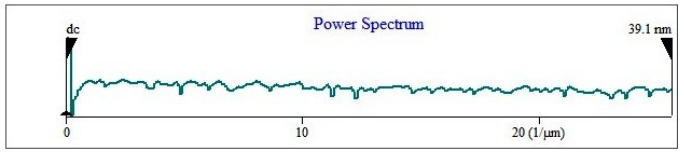


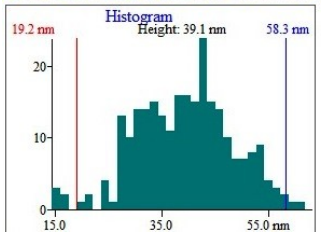
	Rp-v	Rms Rough (Rq)	Ave Rough (Ra)	Mean Ht	Median Ht	Arc length	Bearing Ratio
Line 1	24.98 nm	4.038 nm	3.156 nm	24.91 nm	24.59 nm	6.623 µm	@30.0% 26.94
Delta [.]							

L10

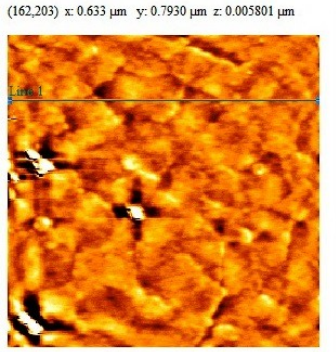


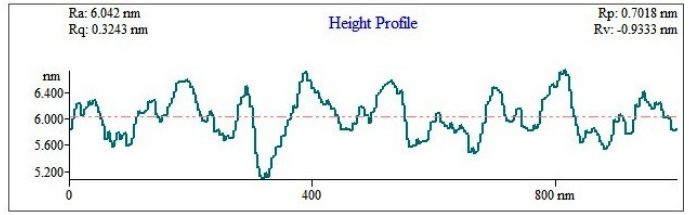


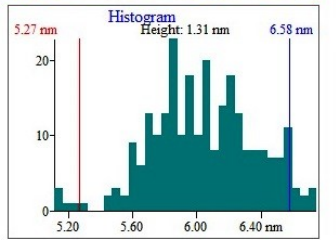




	Rp-v	Rms Rough (Rq)	Ave Rough (Ra)	Mean Ht	Median Ht	Arc length	Bearing Ratio
Line 1	48.83 nm	9.034 nm	7.298 nm	39.25 nm	39.70 nm	29.62 µm	@30.0% 43.77
Delta [.]							



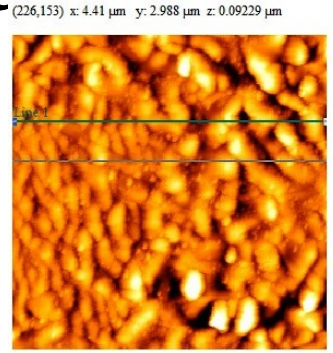


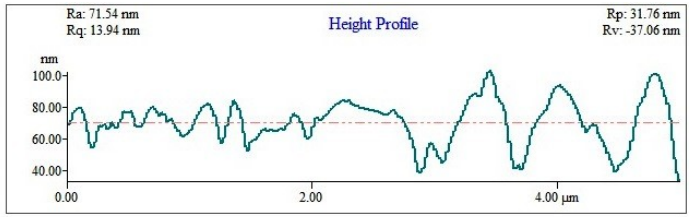


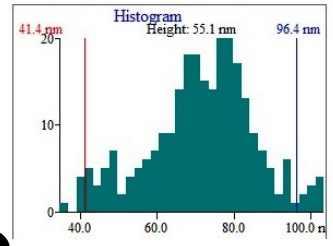
	Rp-v	Rms Rough (Rq)	Ave Rough (Ra)	Mean Ht	Median Ht	Arc length	Bearing Ratio
Line 1	1.635 nm	0.3243 nm	0.2628 nm	6.042 nm	6.043 nm	1.376 µm	@30.0% 6.22
Delta [.]							

L13

Nonirradiated

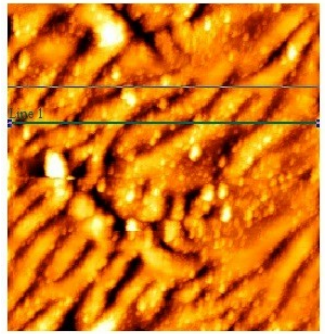


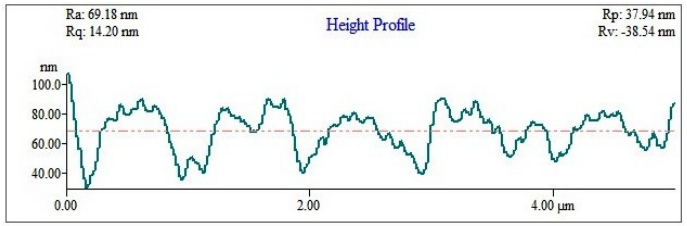


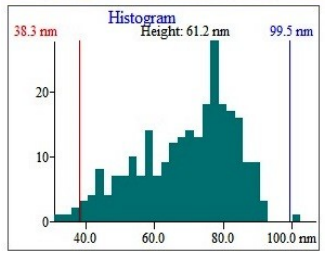


	Rp-v	Rms Rough (Rq)	Ave Rough (Ra)	Mean Ht	Median Ht	Arc length	Bearing Ratio
Line 1	68.82 nm	13.94 nm	10.92 nm	71.54 nm	72.99 nm	5.168 µm	@30.0% 78.82
Delta [.]							

L18

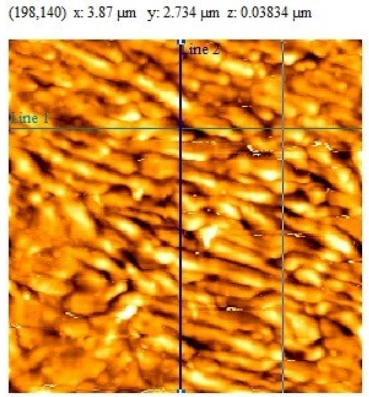


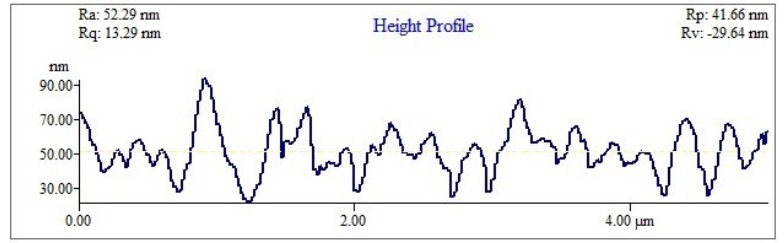


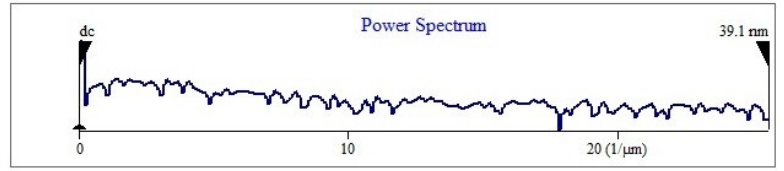


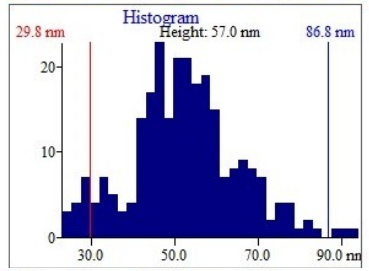
	Rp-v	Rms Rough (Rq)	Ave Rough (Ra)	Mean Ht	Median Ht	Arc length	Bearing Ratio
Line 1	76.47 nm	14.20 nm	11.76 nm	69.18 nm	72.36 nm	6.371 µm	@30.0% 78.19
Delta [.]							

Irradiated

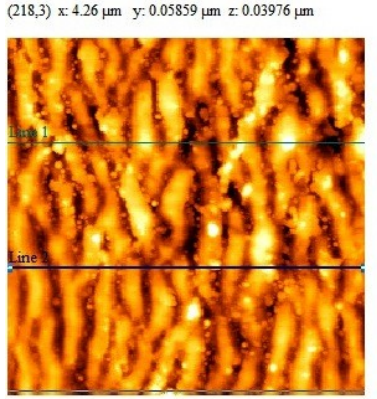


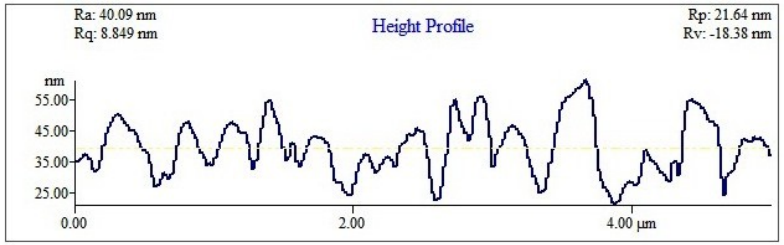


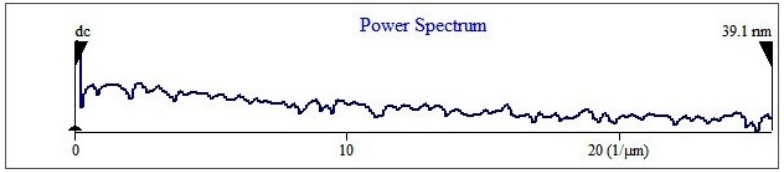


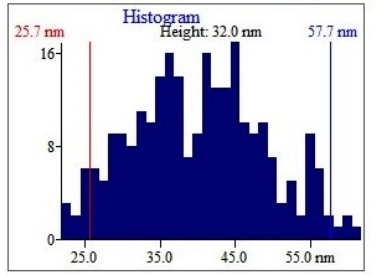


	Rp-v	Rms Rough (Rq)	Ave Rough (Ra)	Mean Ht	Median Ht	Arc length	Bearing Ratio
Line 1	51.45 nm	13.35 nm	11.31 nm	52.24 nm	54.90 nm	5.494 µm	@30.0% 62.00
Line 2	71.30 nm	13.29 nm	10.20 nm	52.29 nm	51.75 nm	5.613 µm	@30.0% 57.74
Delta [.]							





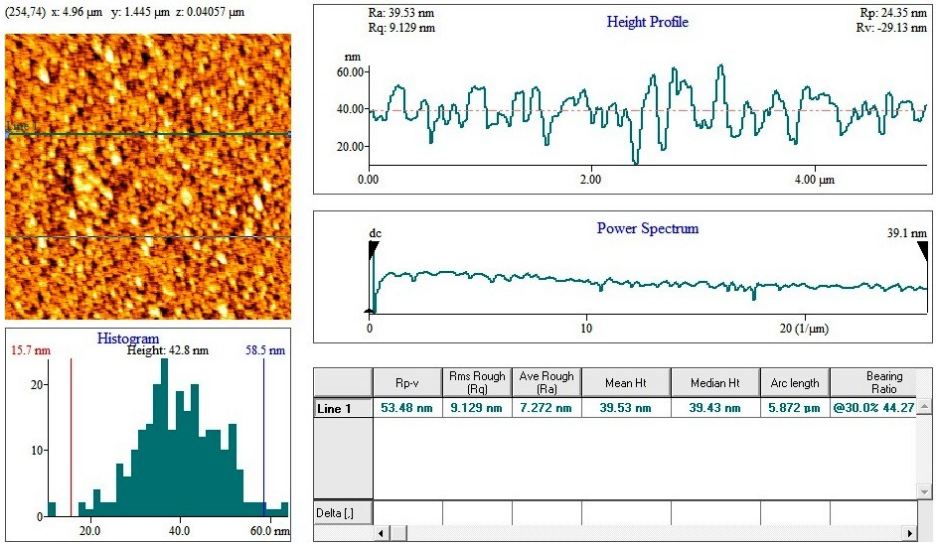




	Rp-v	Rms Rough (Rq)	Ave Rough (Ra)	Mean Ht	Median Ht	Arc length	Bearing Ratio
Line 1	88.14 nm	14.99 nm	11.63 nm	40.08 nm	38.19 nm	5.505 µm	@30.0% 46.36
Line 2	40.02 nm	8.849 nm	7.282 nm	40.09 nm	40.15 nm	5.524 µm	@30.0% 44.66
Delta [.]							

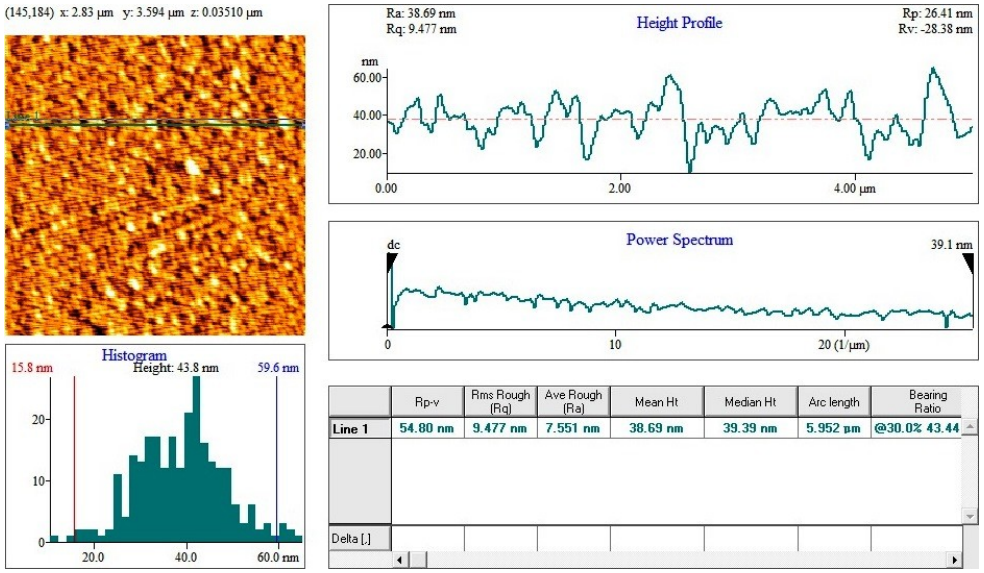
L23

Nonirradiated



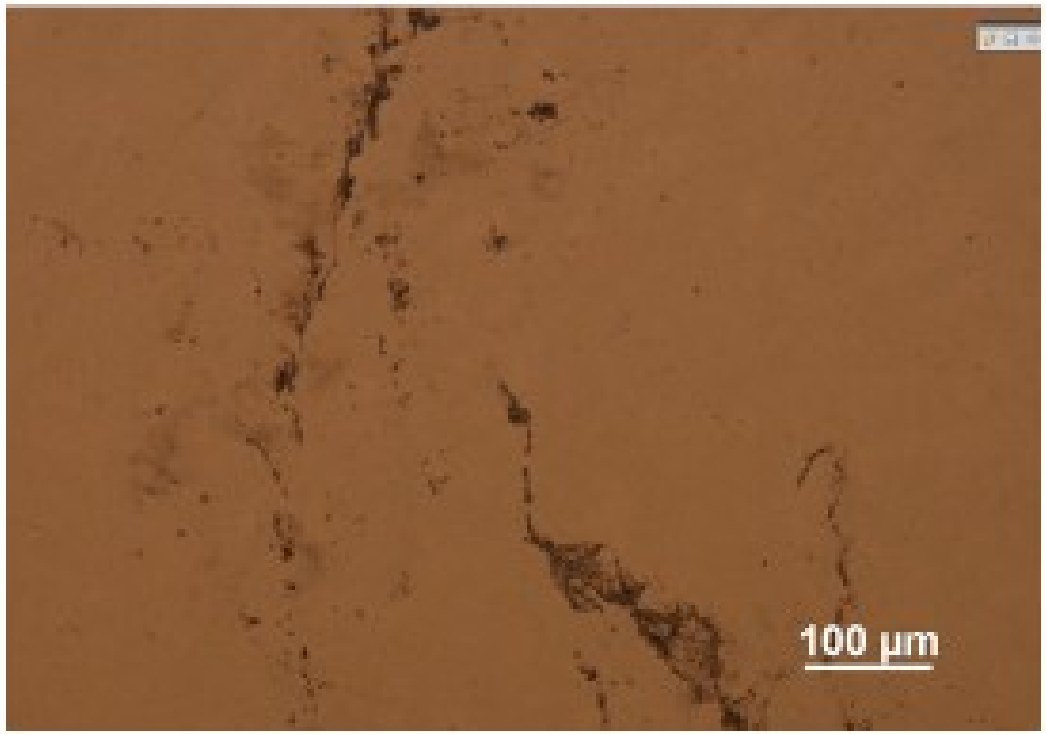
	Rp-v	Rms Rough (Rq)	Ave Rough (Ra)	Mean Ht	Median Ht	Arc length	Bearing Ratio
Line 1	53.48 nm	9.129 nm	7.272 nm	39.53 nm	39.43 nm	5.872 µm	@30.0% 44.27
Delta [.]							

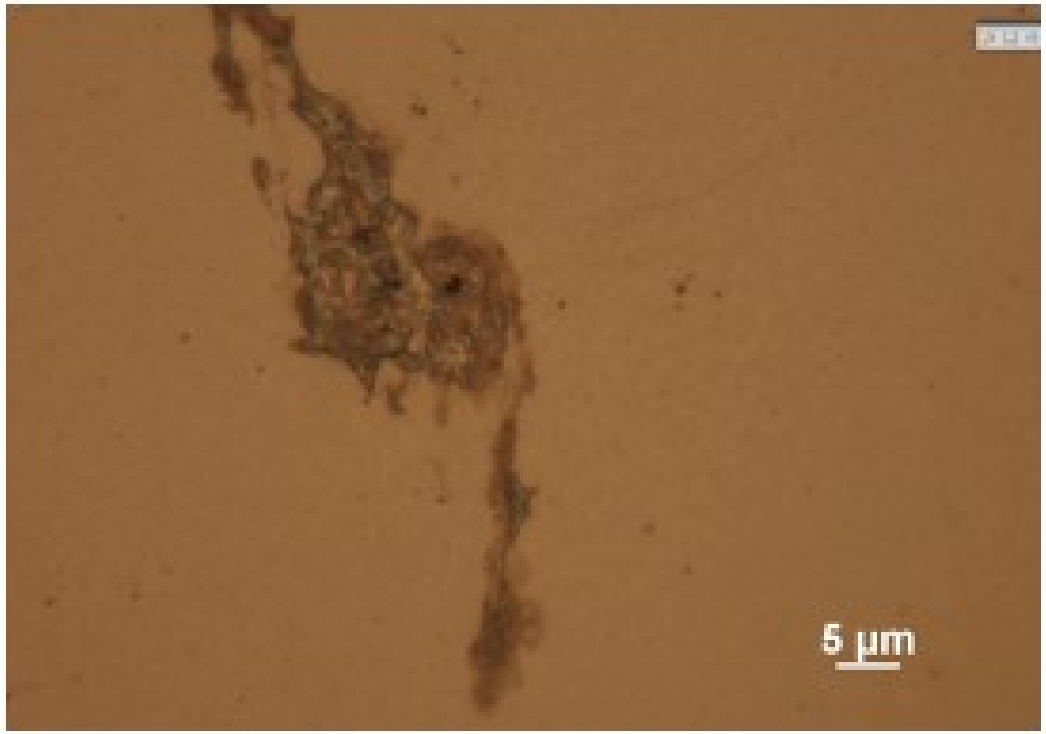
Irradiated



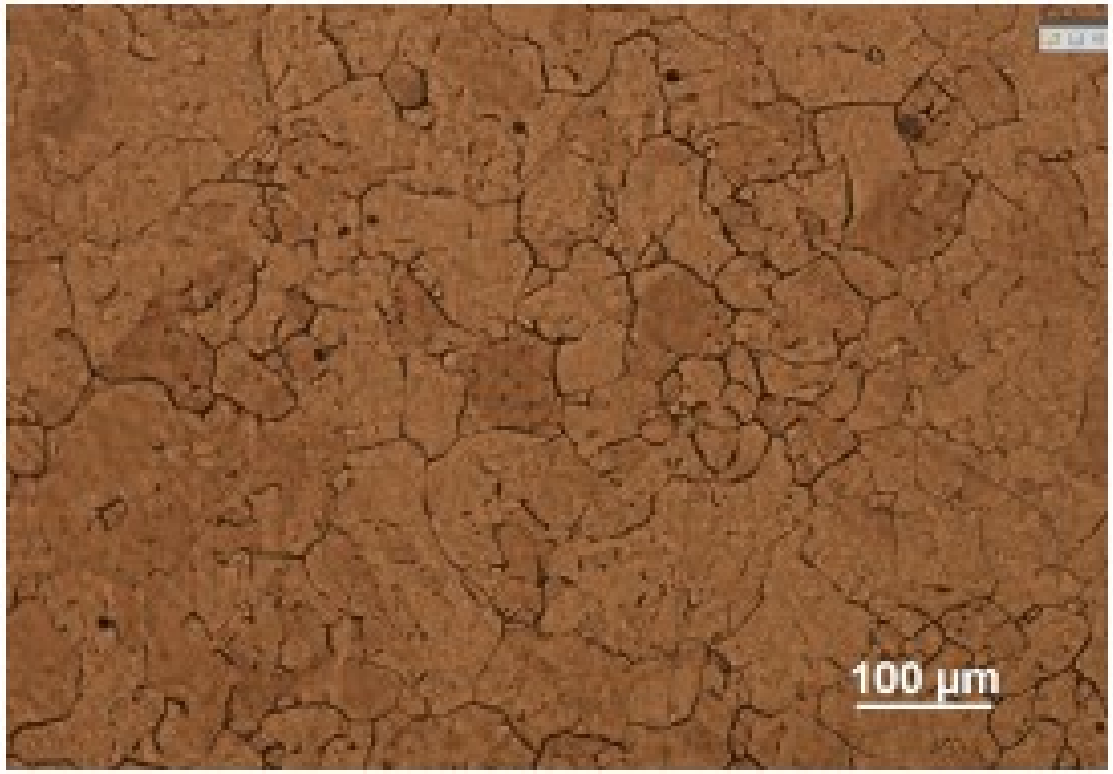
	Rp-v	Rms Rough (Rq)	Ave Rough (Ra)	Mean Ht	Median Ht	Arc length	Bearing Ratio
Line 1	54.80 nm	9.477 nm	7.551 nm	38.69 nm	39.39 nm	5.952 µm	@30.0% 43.44
Delta [.]							

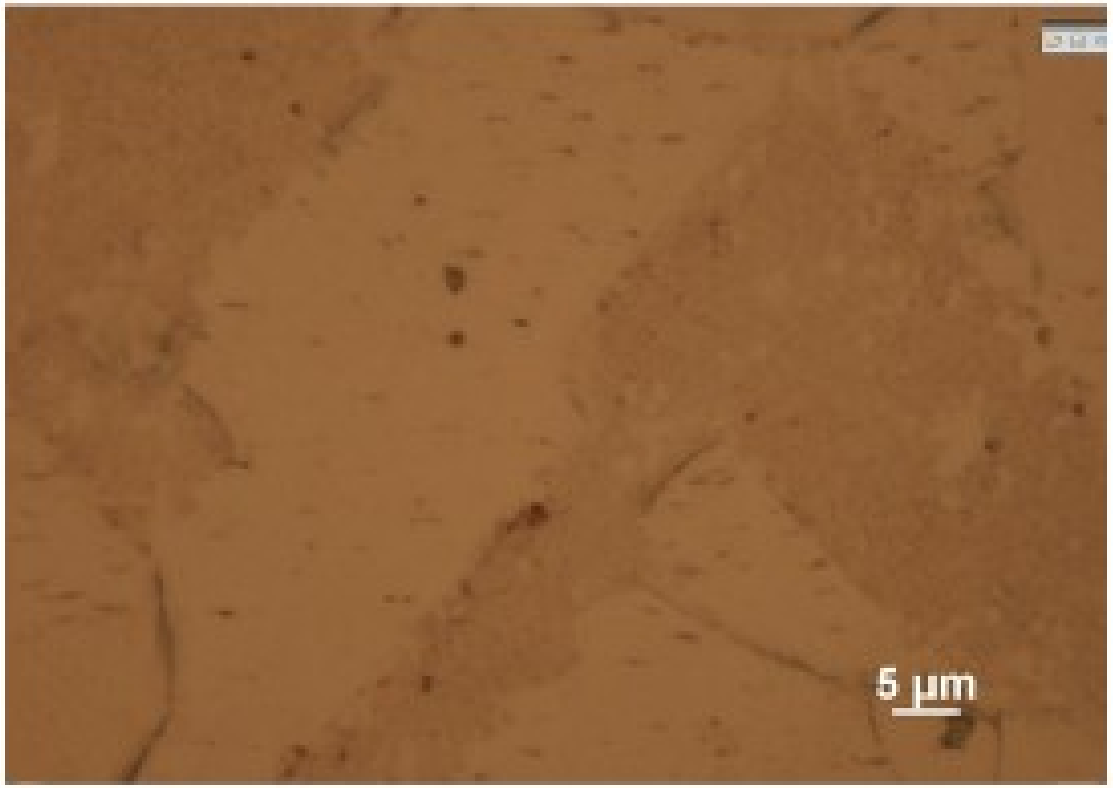
L10

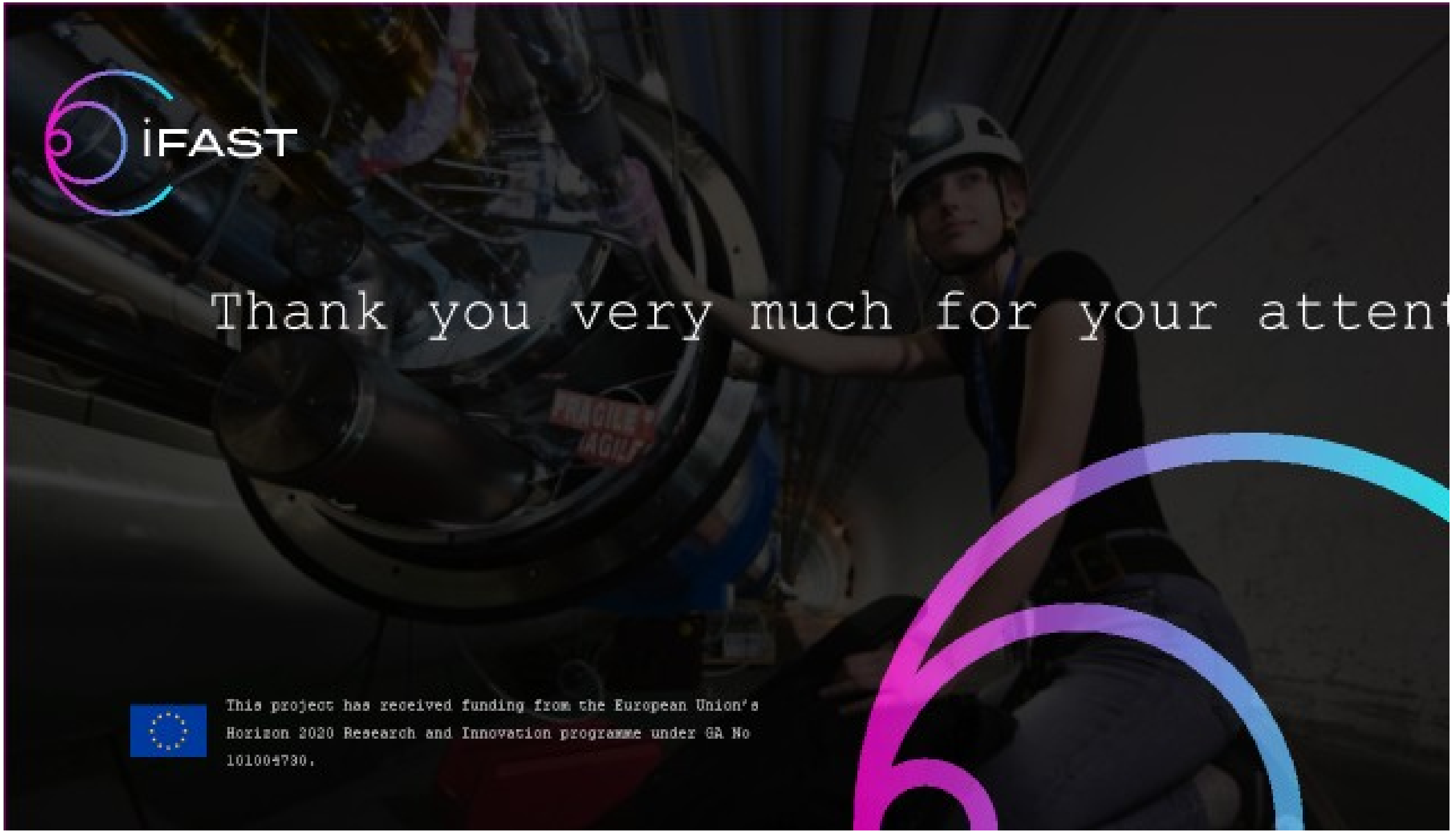




L18






iFAST
Thank you very much for your attent
This project has received funding from the European Union's Horizon 2020 Research and Innovation programme under GA No 101004730.