

Bruker alicona

**EXPERIENCE
METROLOGY!**

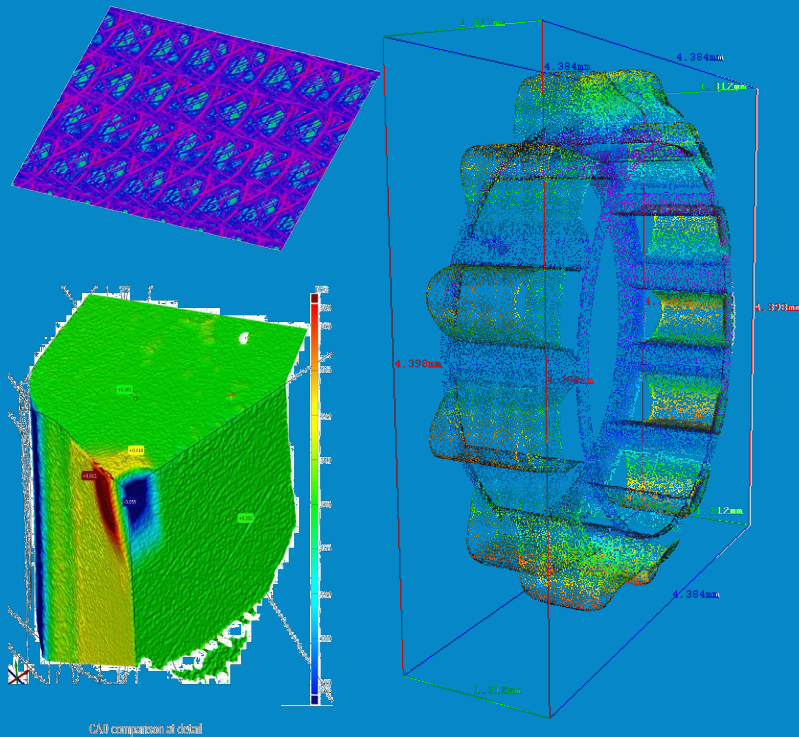


Polyethylen Part of a Knee Implant

One Click Roughness



- » Fondata nel 2001 in Austria (Graz)
- » Team internazionale di 150 persone
- » Età media 34 anni
- » Bruker (9700 dipendenti)





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Sales Manager Italy - Ticino

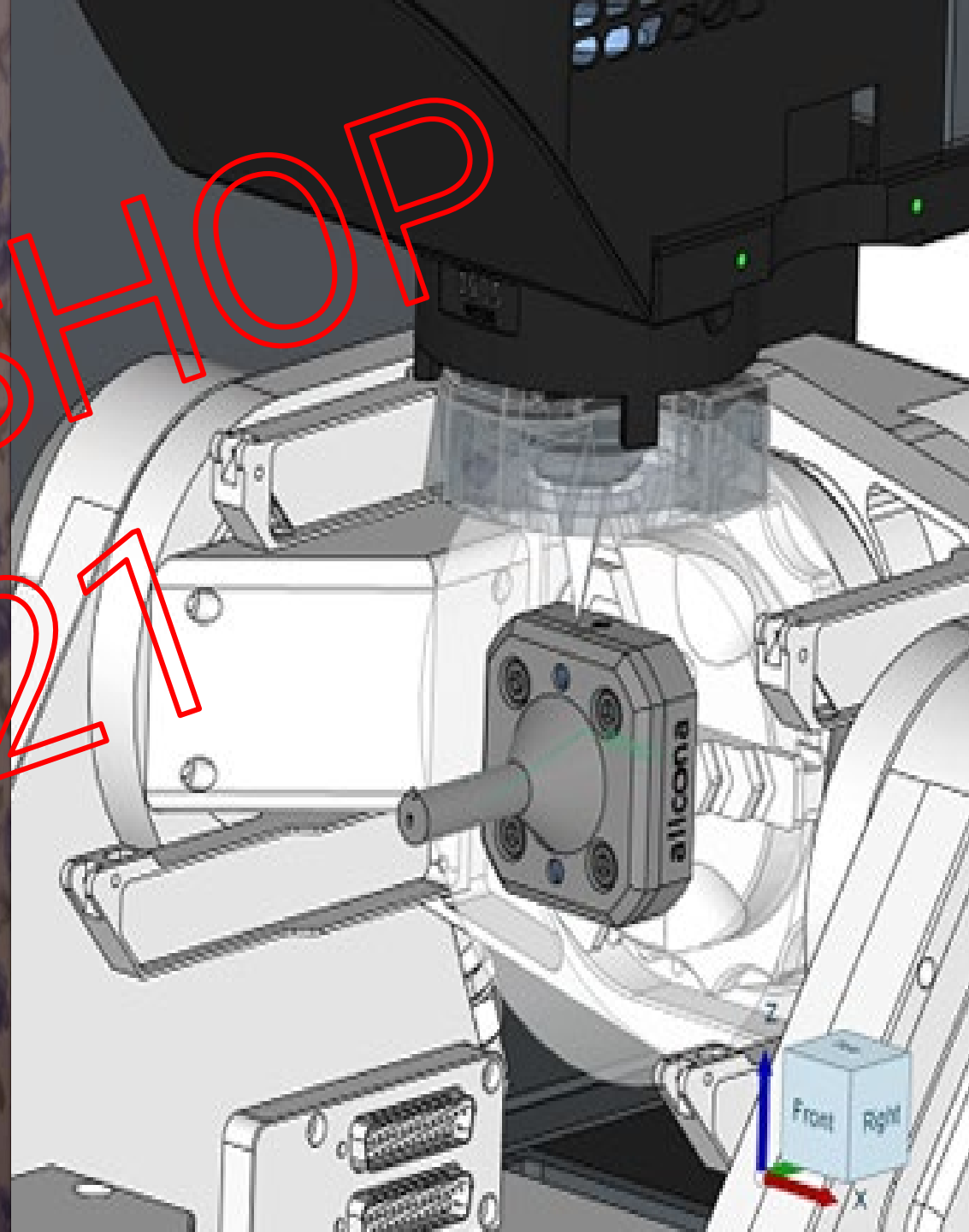
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DIGITAL TWIN

WORKSHOP
2021



PILLOLA ROSSA

CONTINUI A MISURARE
COME GIA' FAI

PILLOLA BLU

PROG.STEP

PMI→CAD

GD&T+Rugosità

Automazione

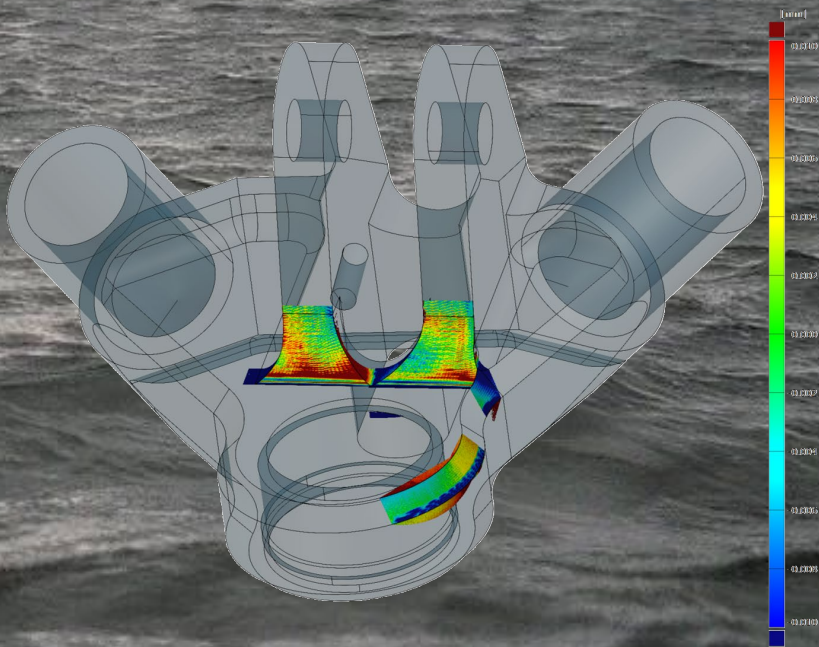
WORKSHOP
2023



Metrology on earth is slowly dying

2024

WORKSHOP
2024



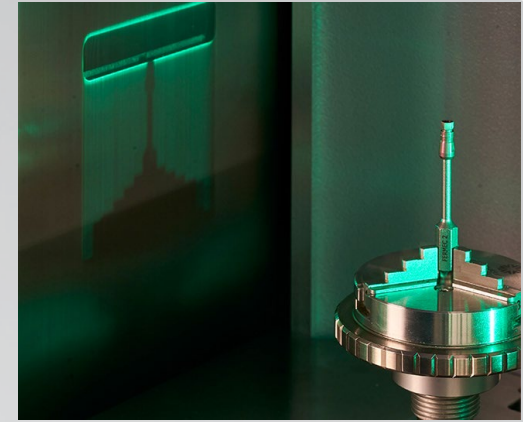
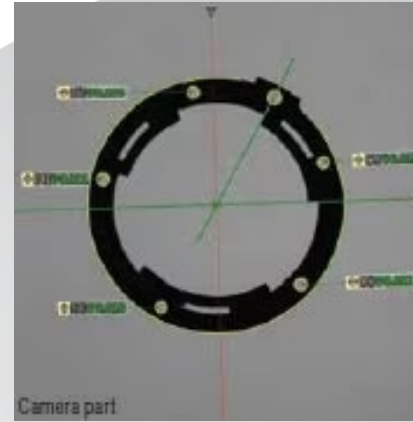
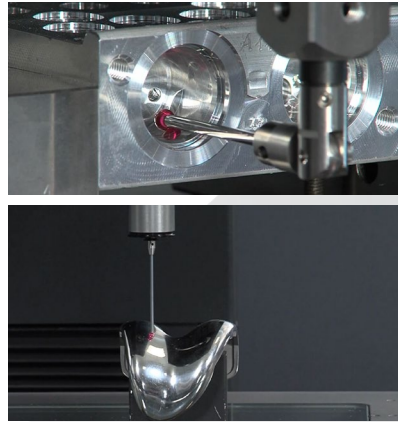


POSIZIONE, FORMA, SUPERFICI e DIFETTI

□GD&T

□RUGOSITA'

□BAVE



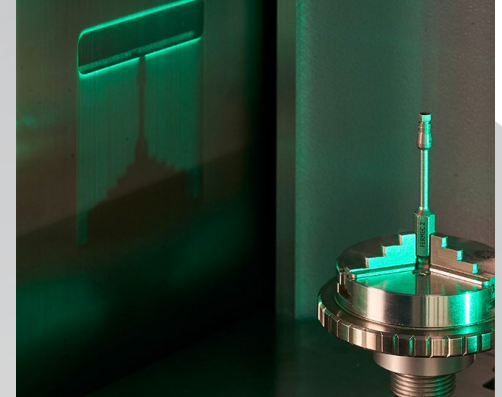
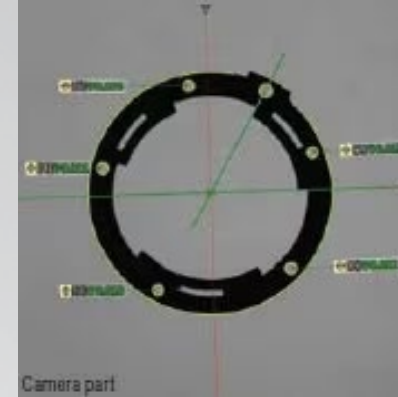
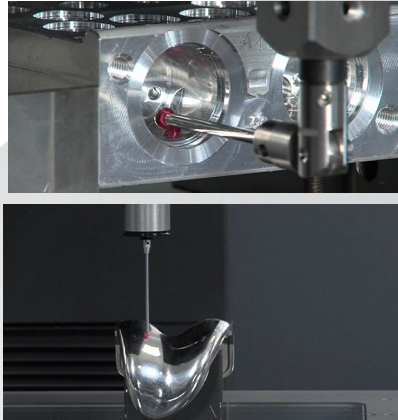
□SCHEGGIATURE

□SCRATCH



Metrologia Moderna

POSIZIONE, FORMA, SUPERFICI e DIFETTI



NON OGGETTIVO
SE SBAGLIO IL
POSIZIONAMENTO

SMUSSI – BREAK
EDGE POCO
RIPETIBILI

NON OGGETTIVO

NUMERO DI PUNTI RIDOTTO

INGOMBRO

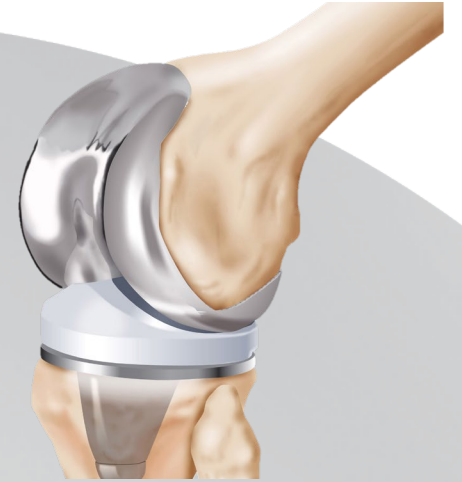
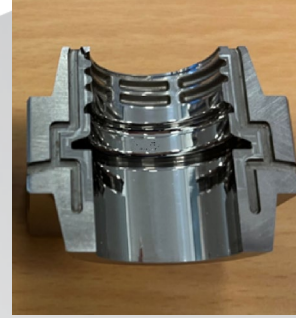
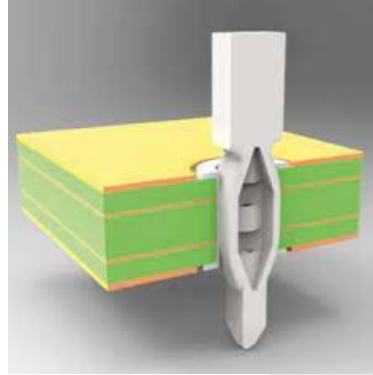
FORME LIBERE

PROIEZIONE 2D di una MISURA 3D

STAFFAGGIO

Metrologia Moderna

COMPONENTI DI ESTREMA COMPLESSITA' E PRECISIONE



GRAFFIO LA SUPERFICE
DEFORMO IL COMPONENTE MENTRE MISURO
INCASTRO UN TASTATORE
NON RAGGIUNGO PROFONDITA' E CAVITA'
NON DESCRIVO FORME LIBERE ed INTRICATE
NON DISCRIMINO UNA BAVA PERICOLOSA da UNA NON DANNOSA





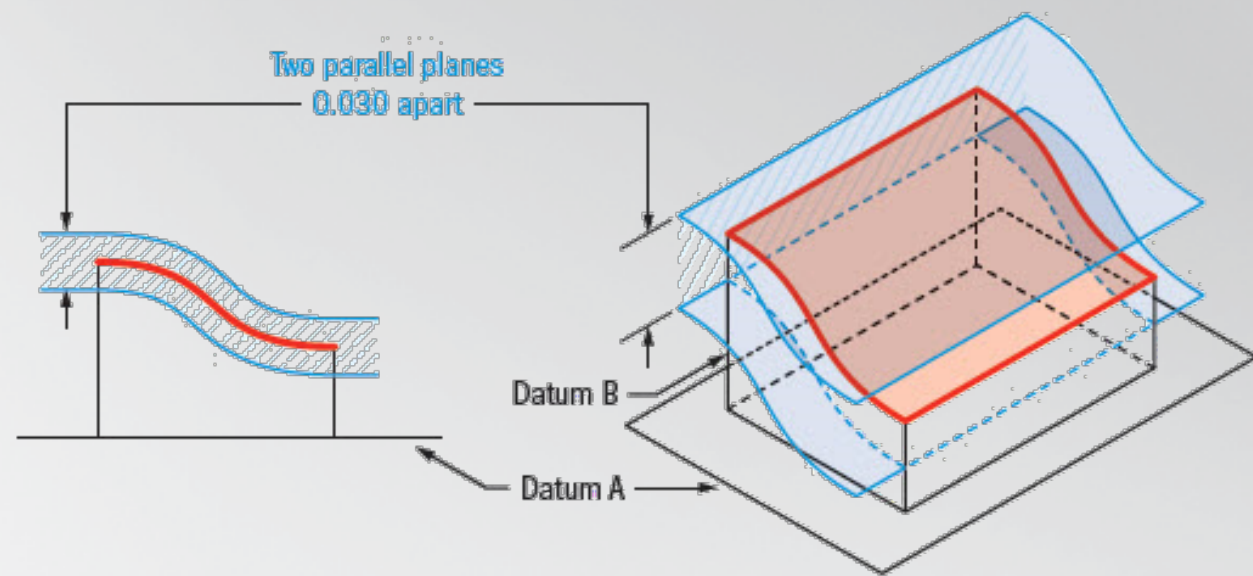
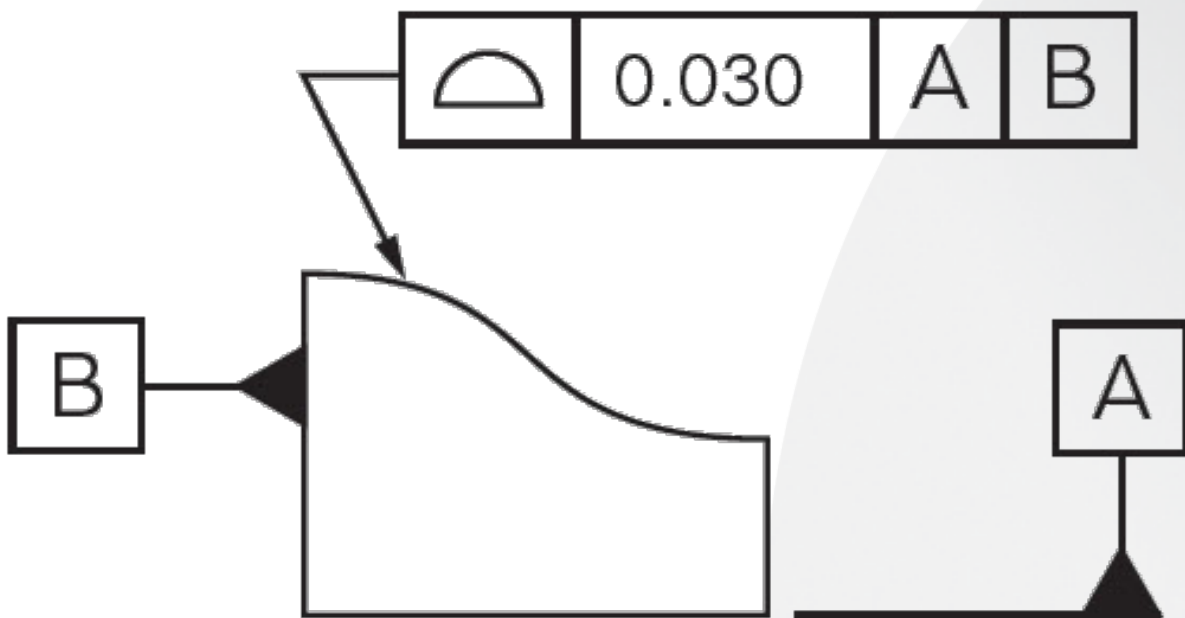
1 - GD&T

2 - DEFECTS

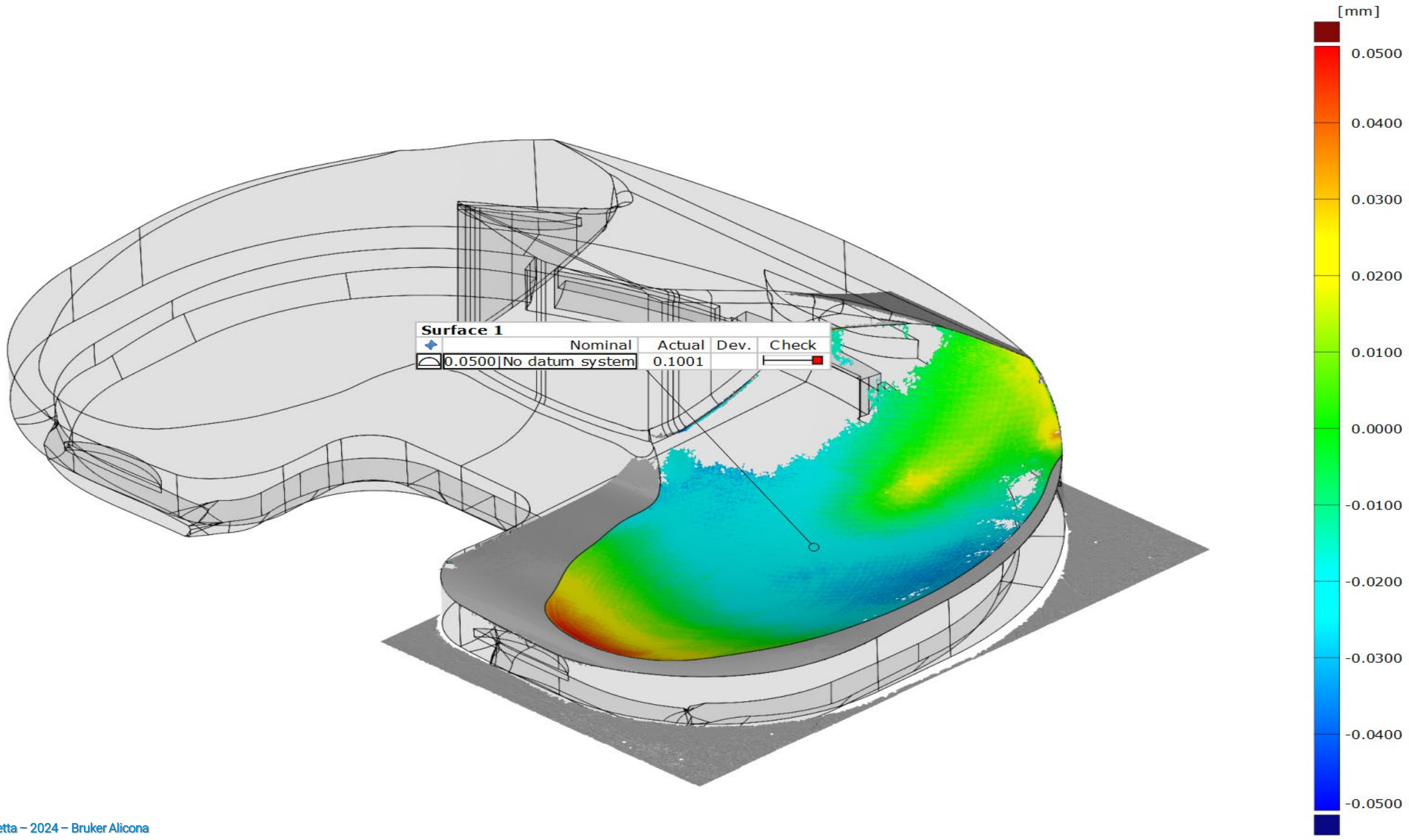
3 - ROUGH

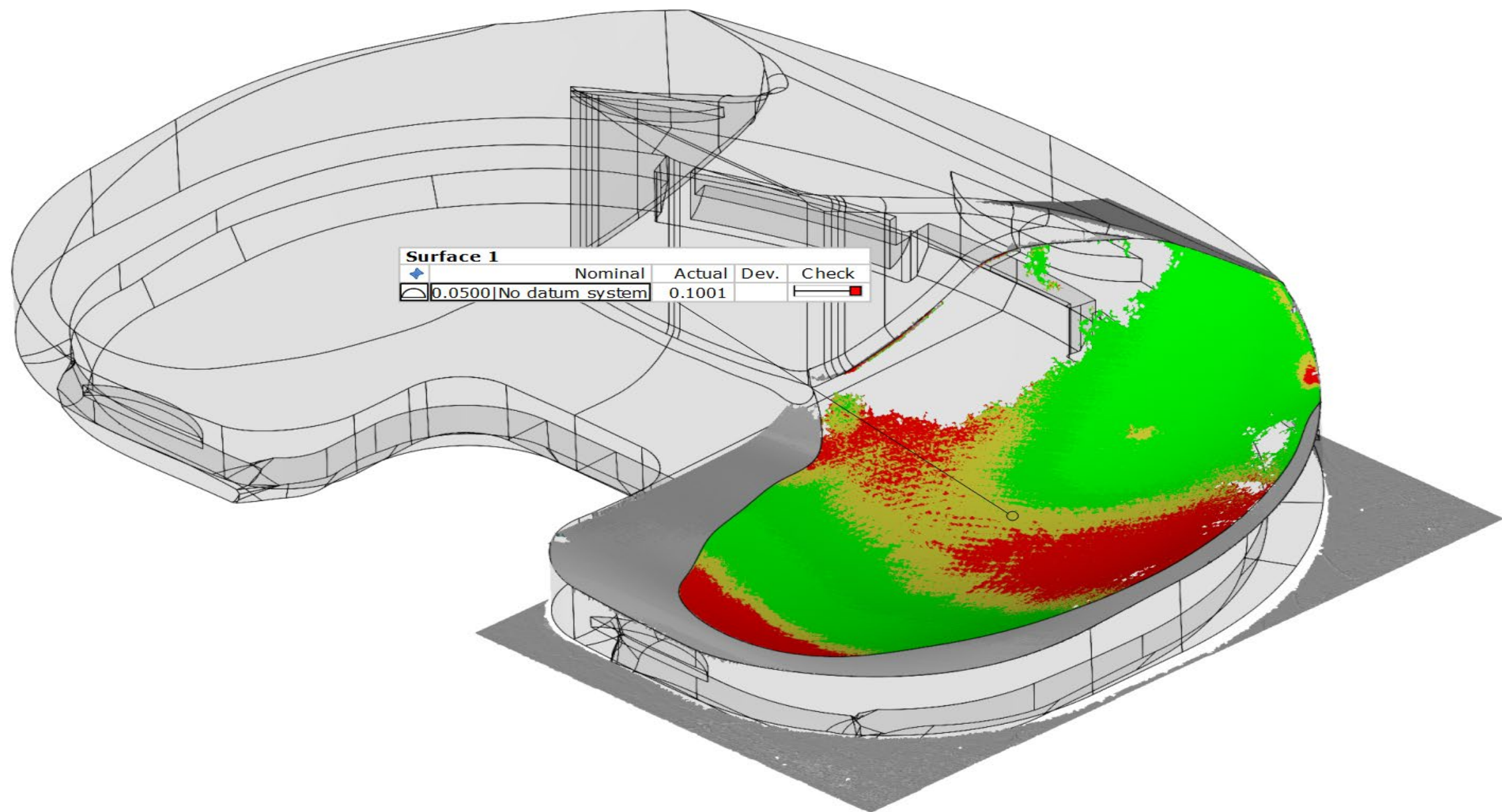
Metrologia Moderna

1 - GD&T



GD&T





Tolerance [Tol.]

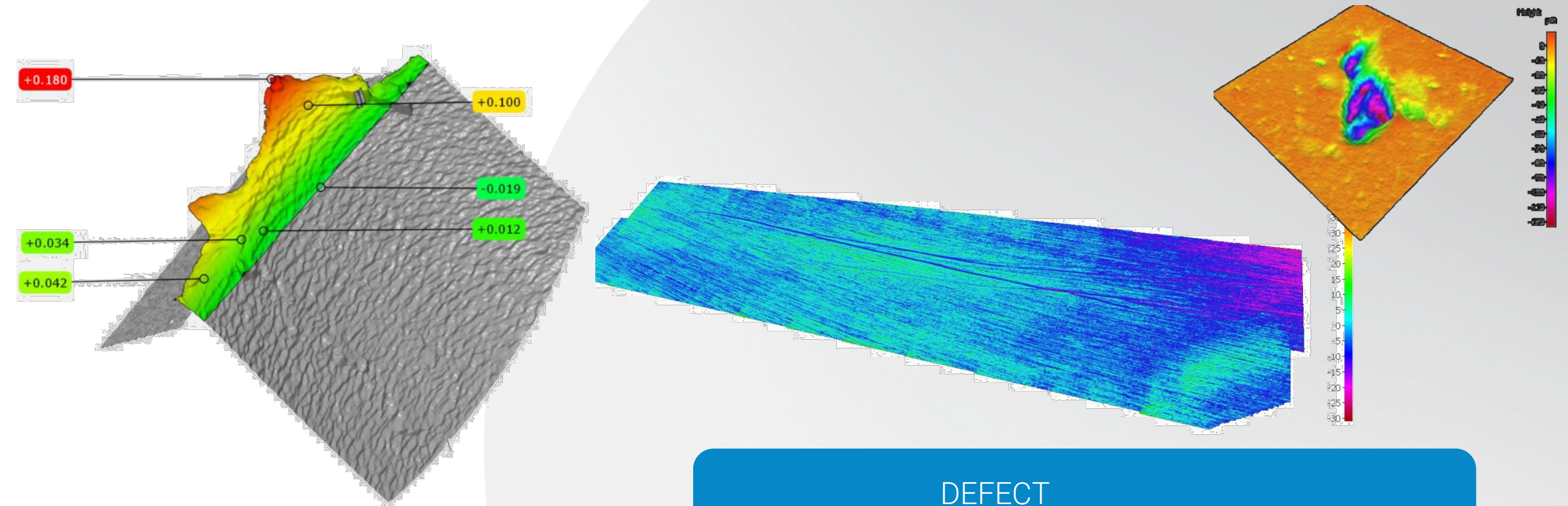
Fail

Warn

Pass



2 - DEFECTS



AUTO-DIFF

Settings

Options

Compare By Region

Stock Component

Design Component

Comparison Method

Comparison Type

Stock

Design

Surface

Both

Comparison Tolerance

Gauge

Range (mm)

Color

20.00000

12:Thistle

0.00600

1:Red

0.00500

55:AutoDiff_G5

0.00400

54:AutoDiff_G4

0.00300

53:AutoDiff_G3

0.00200

52:AutoDiff_G2

0.00100

51:AutoDiff_G1

0.00000

5:Dim Gray

Excess

Range (mm)

Color

5.00000

12:Thistle

0.00300

12:Magenta

0.00250

60:AutoDiff_E5

0.00200

59:AutoDiff_E4

0.00150

58:AutoDiff_E3

0.00100

57:AutoDiff_E2

0.00050

56:AutoDiff_E1

0.00000

5:Dim Gray

Add

Delete

Add

Delete

Display

☒ AUTO-DIFF Results

Translucent

Solid

Design

Translucent

Solid

Stock

Translucent

Solid

Fixture

Translucent

Solid

Include Tool to Stock Collisions

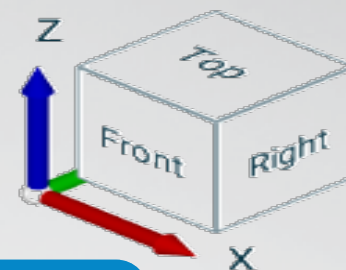
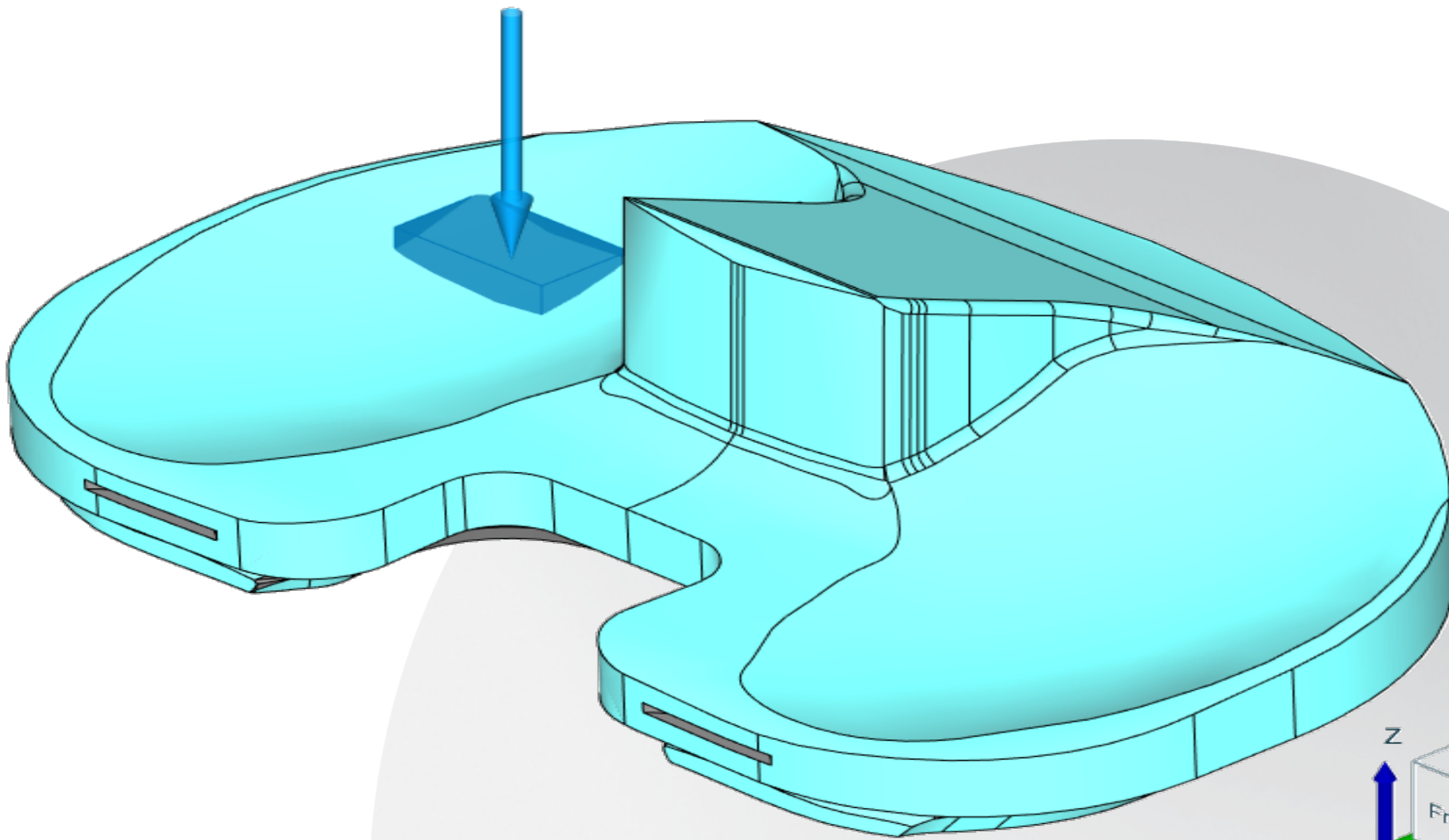
Error Detected, Check Logger

Apply

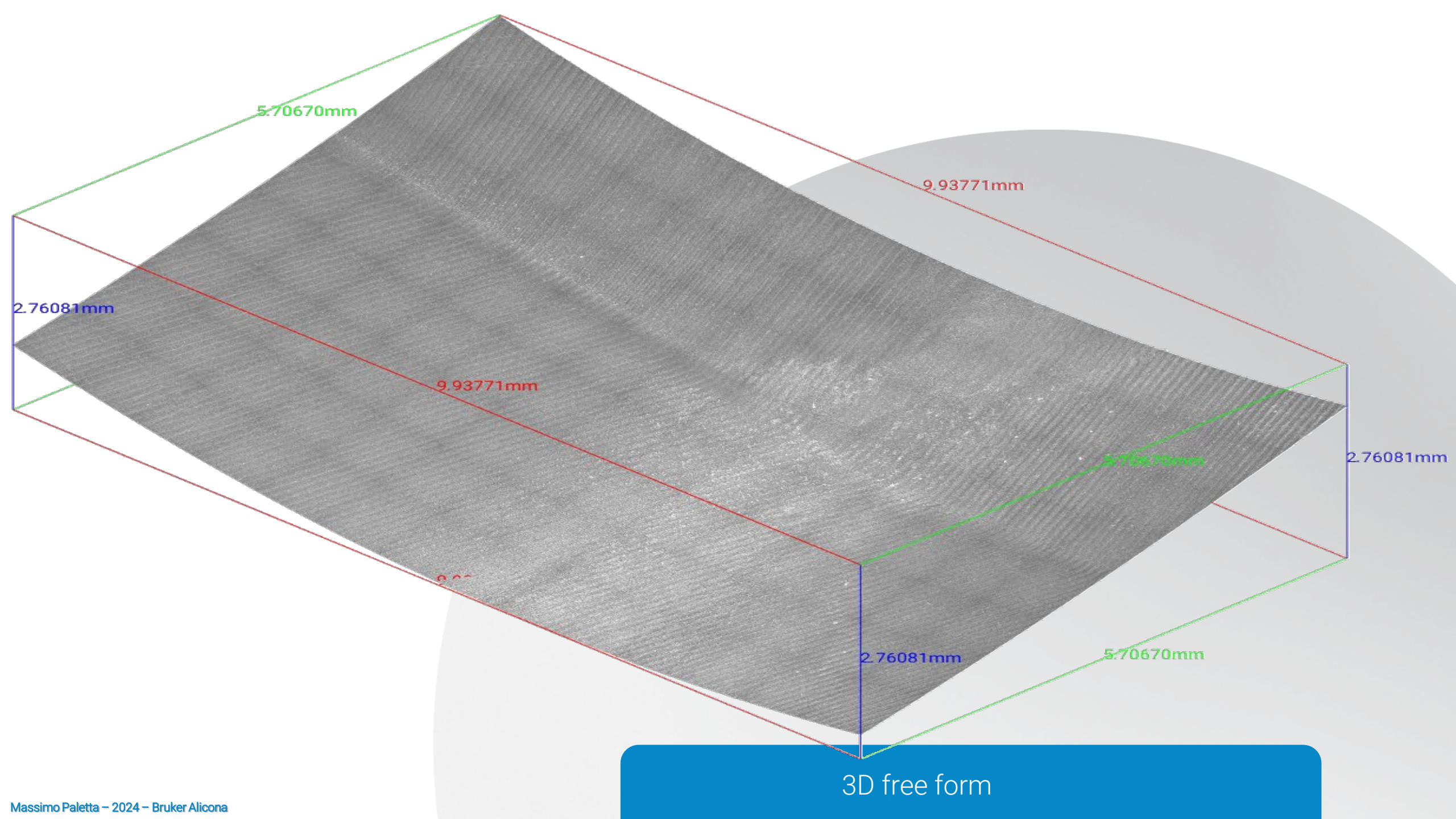
Compare

Restore

View 2 - Stock (Workpiece)



DEFECT SEARCH



3D free form

Degree of Polynomial

5

Method

Auto / Best Fit

Input Dataset

58789909192939495mm

mm

44

43

42

41

40

39

38

37

mm

69.2

69

68.8

68.6

68.4

68.2

68

67.8

67.6

67.4

67.2

67

66.8

66.6

Output Datasets

Form Removed Dataset

Form Dataset

0.511.522.533.544.555.566.577.588.599.5mm

mm

5.5

5

4.5

4

3.5

3

2.5

2

1.5

1

0.5

0

5

Subrange

μm

6

4

2

0

-2

-4

-6

Waviness of form removed dataset

Name	Value	Unit	Description
Sa	0.00095	mm	Average height of selected area
Sq	0.00106	mm	Root-Mean-Square height of selected area
Sz	0.00417	mm	Maximum height of selected area
Lc	3.91872	mm	LambdaC: cutoff wavelength

Note: This is the surface roughness of the form removed dataset's waviness.

Settings

Save Form Removed Dataset

Save Form Dataset

Close



1.5 -9 -8.5 -8 -7.5 -7 -6.5 -6 -5.5 -5 -4.5 -4 -3.5 -3 -2.5 -2 -1.5 -1 -0.5 0 0.5 1 1.5 2 2.5 3 3.5 4 4.5 5 5.5 6 6.5 7 7.5 8 8.5 9 mm

Polygon Profile Settings

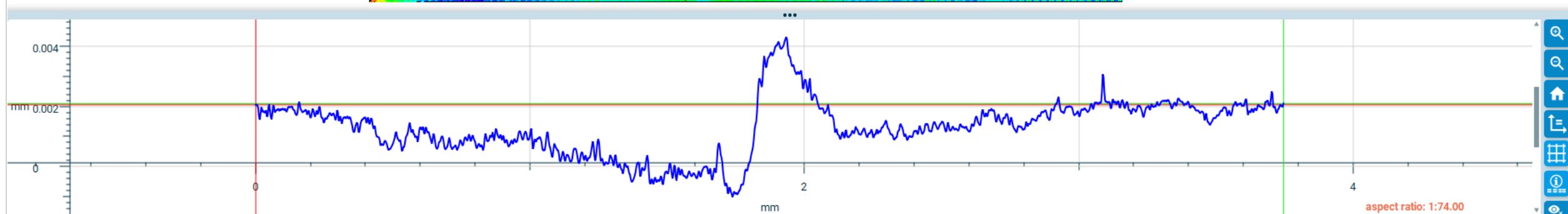
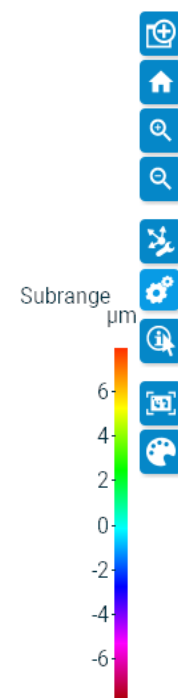
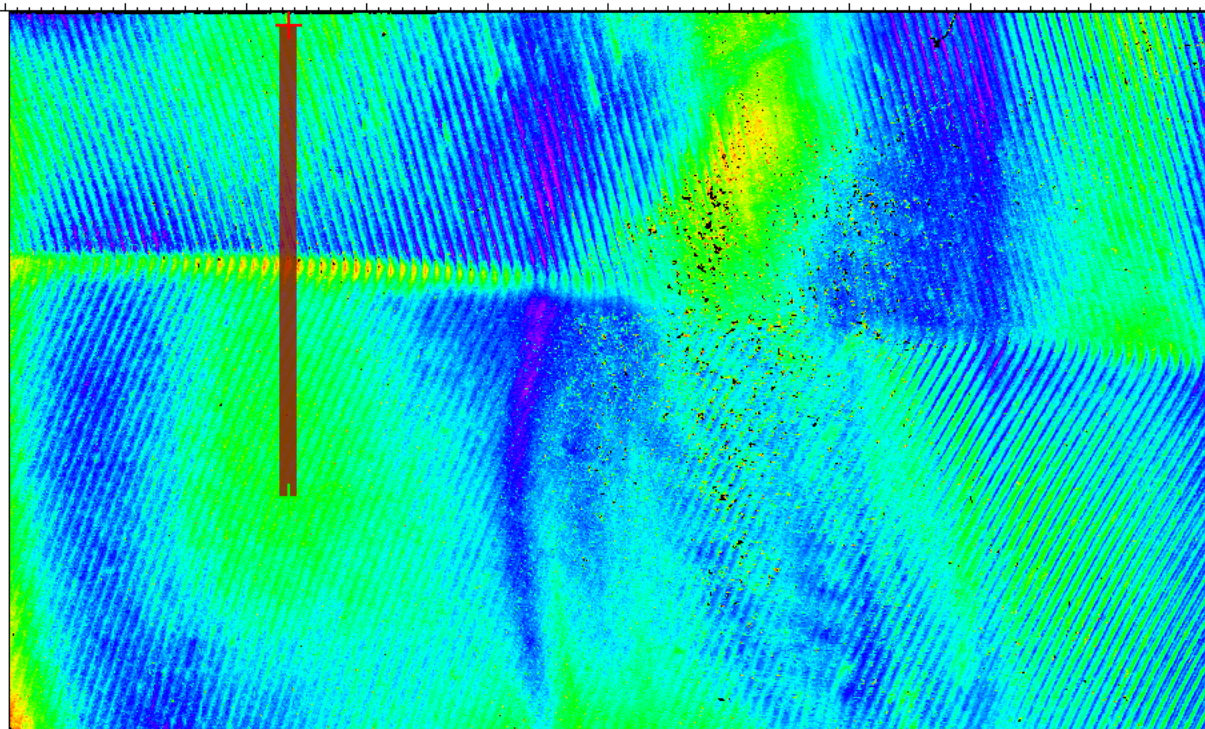
Profile: _____

Width (# Profiles):

Width (metric):

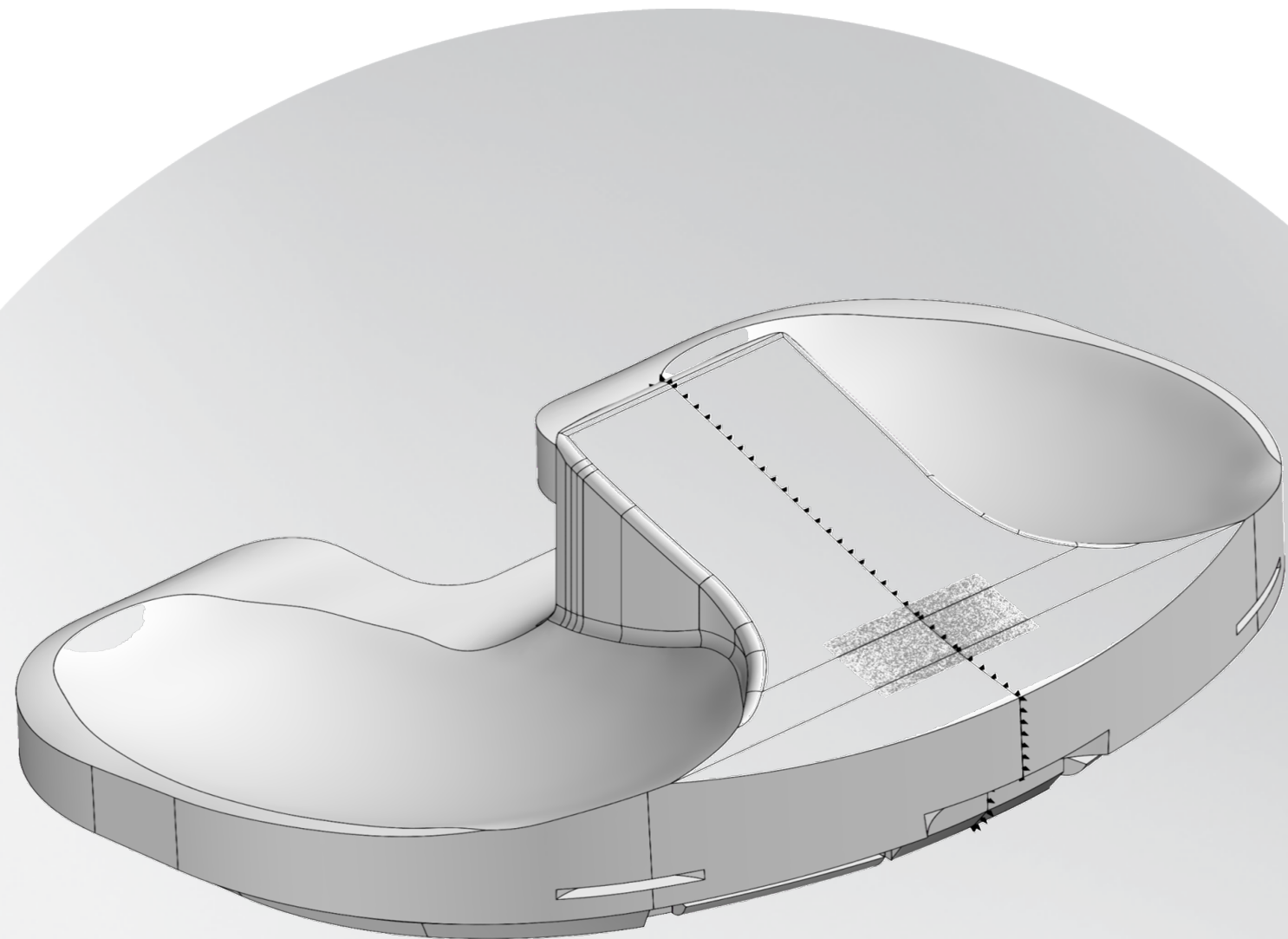
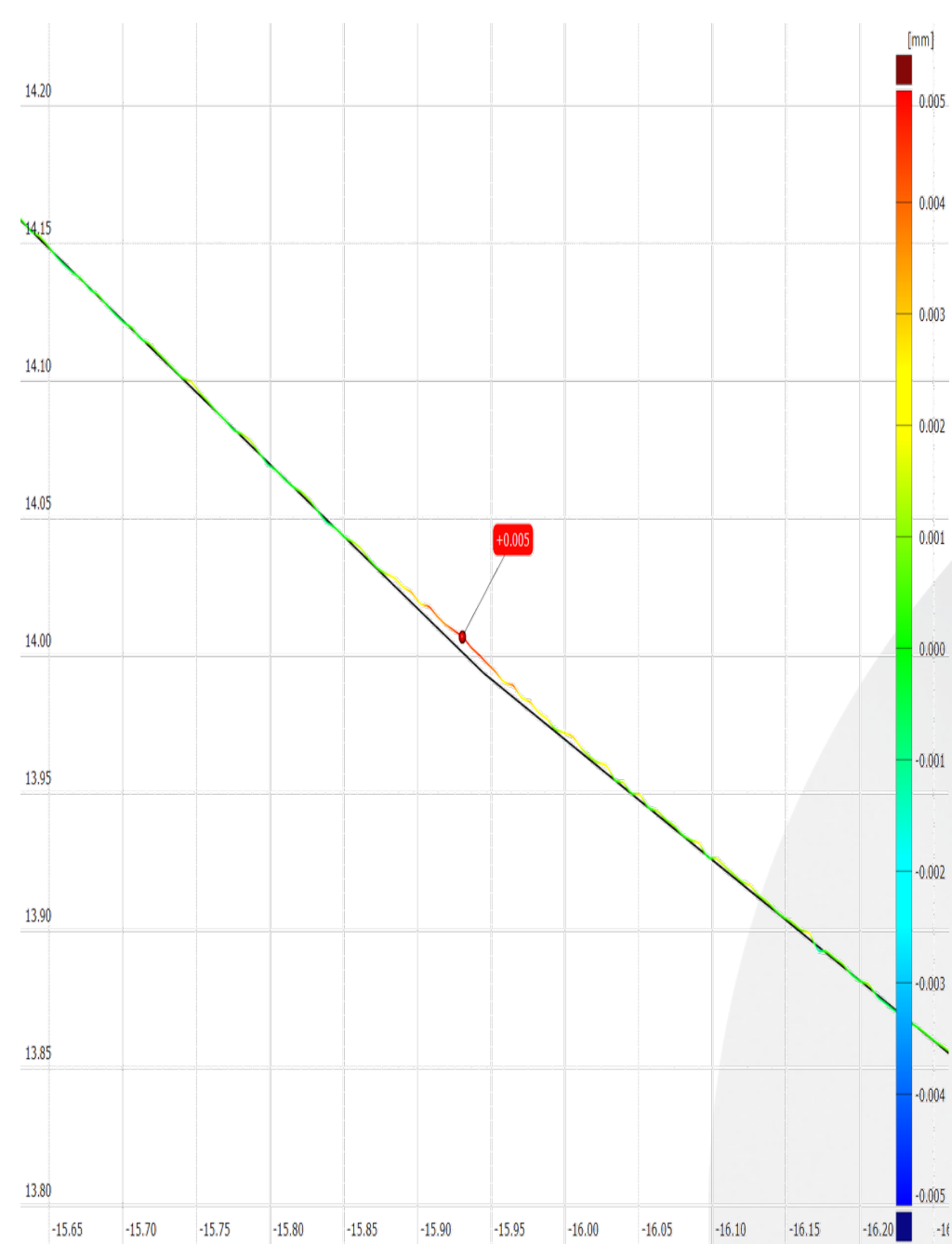
Type:

☐ Continuous Contour

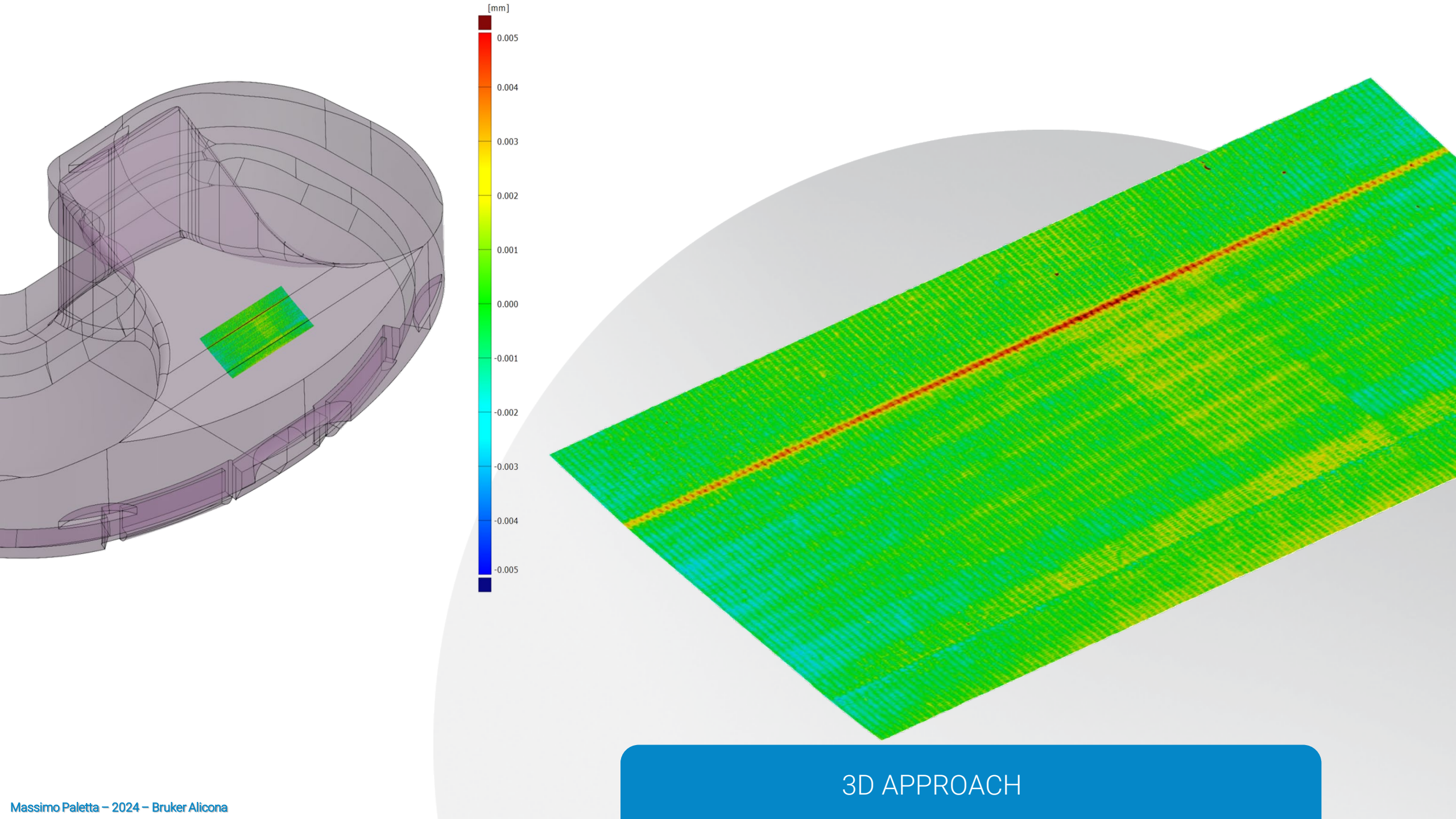


Reference Position	I	3.74747mm	Measure Position	I	0.00000mm	Relative Measurement	ΔI	-3.74747mm	Angle:	180.00068°
	z	0.00210mm		z	0.00206mm		Δz	-0.00004mm	Distance:	3.74747mm

aspect ratio: 1:74.00

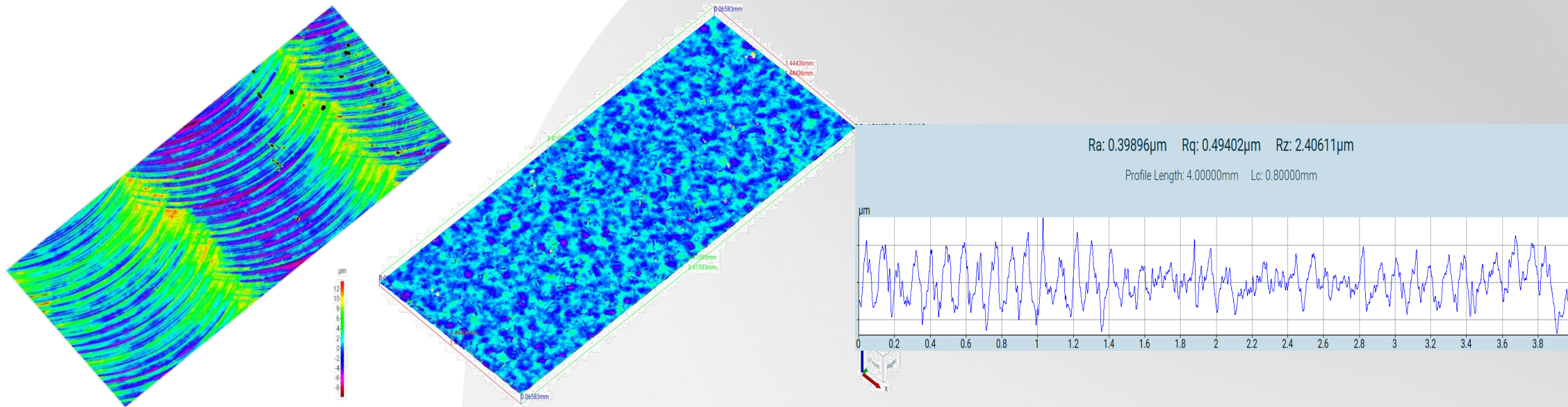


2D APPROACH





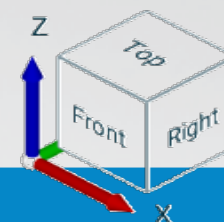
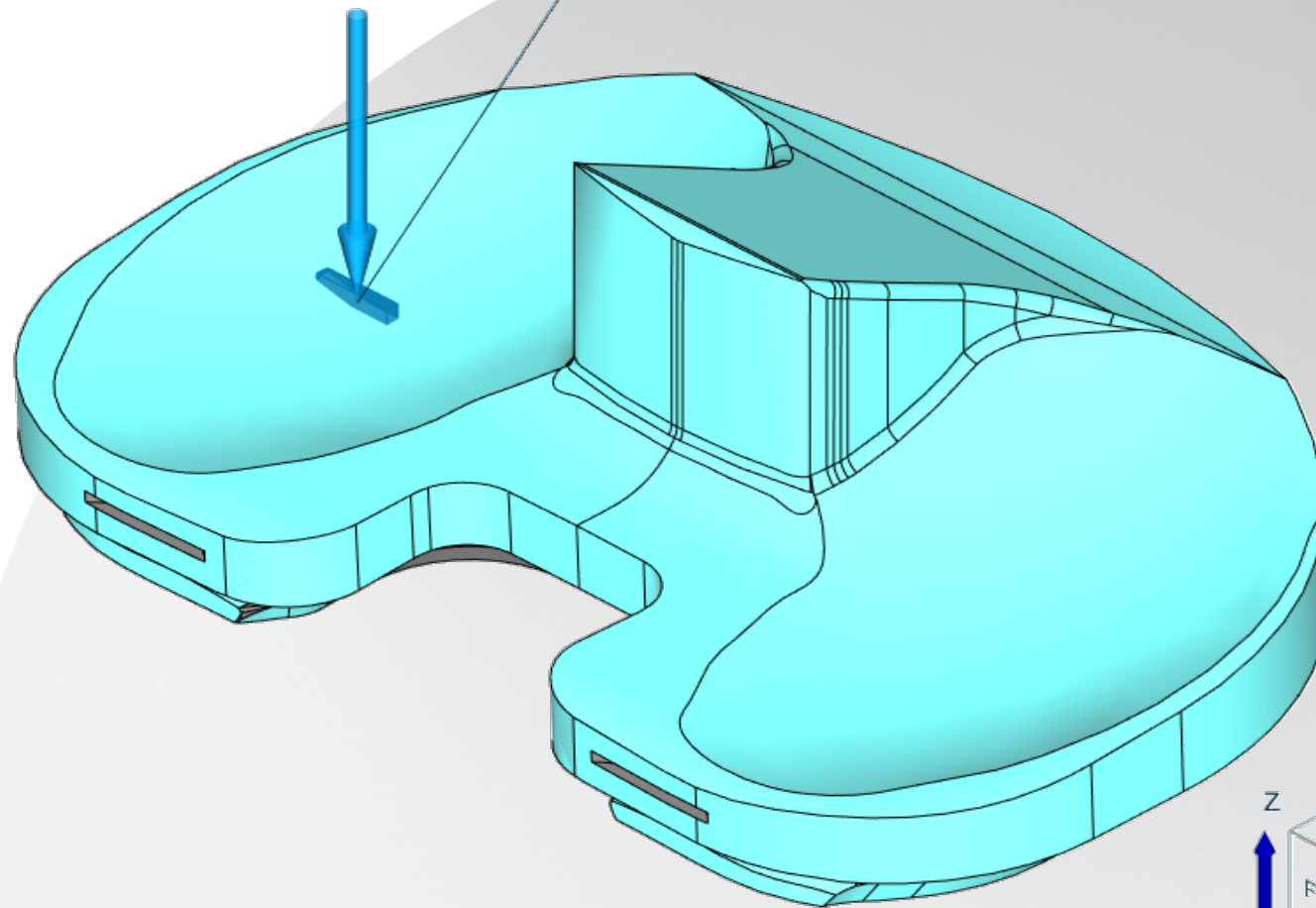
3 - ROUGH



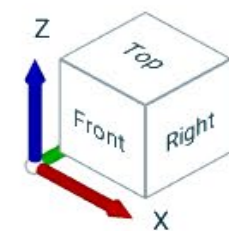
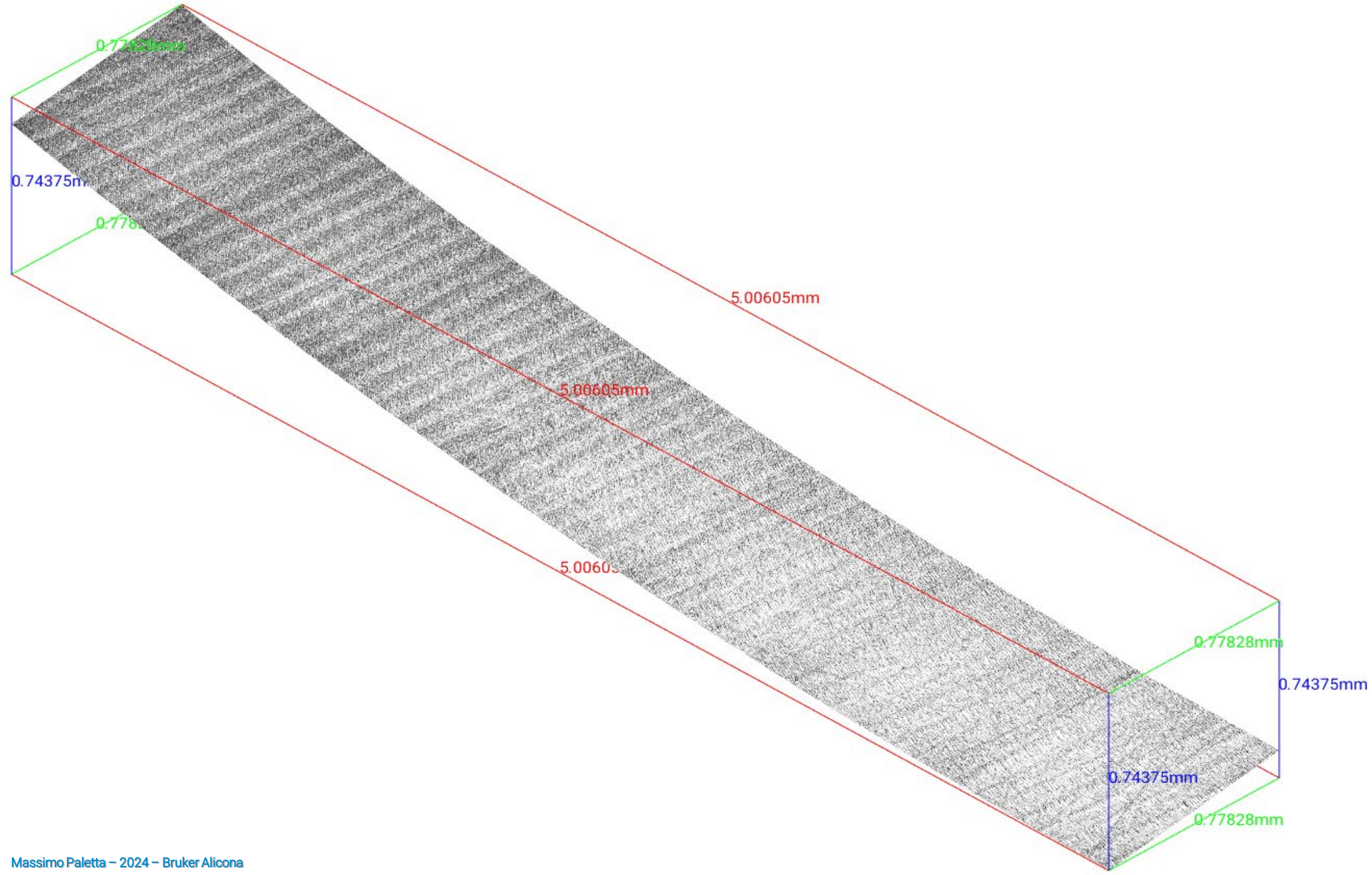
ROUGHNESS

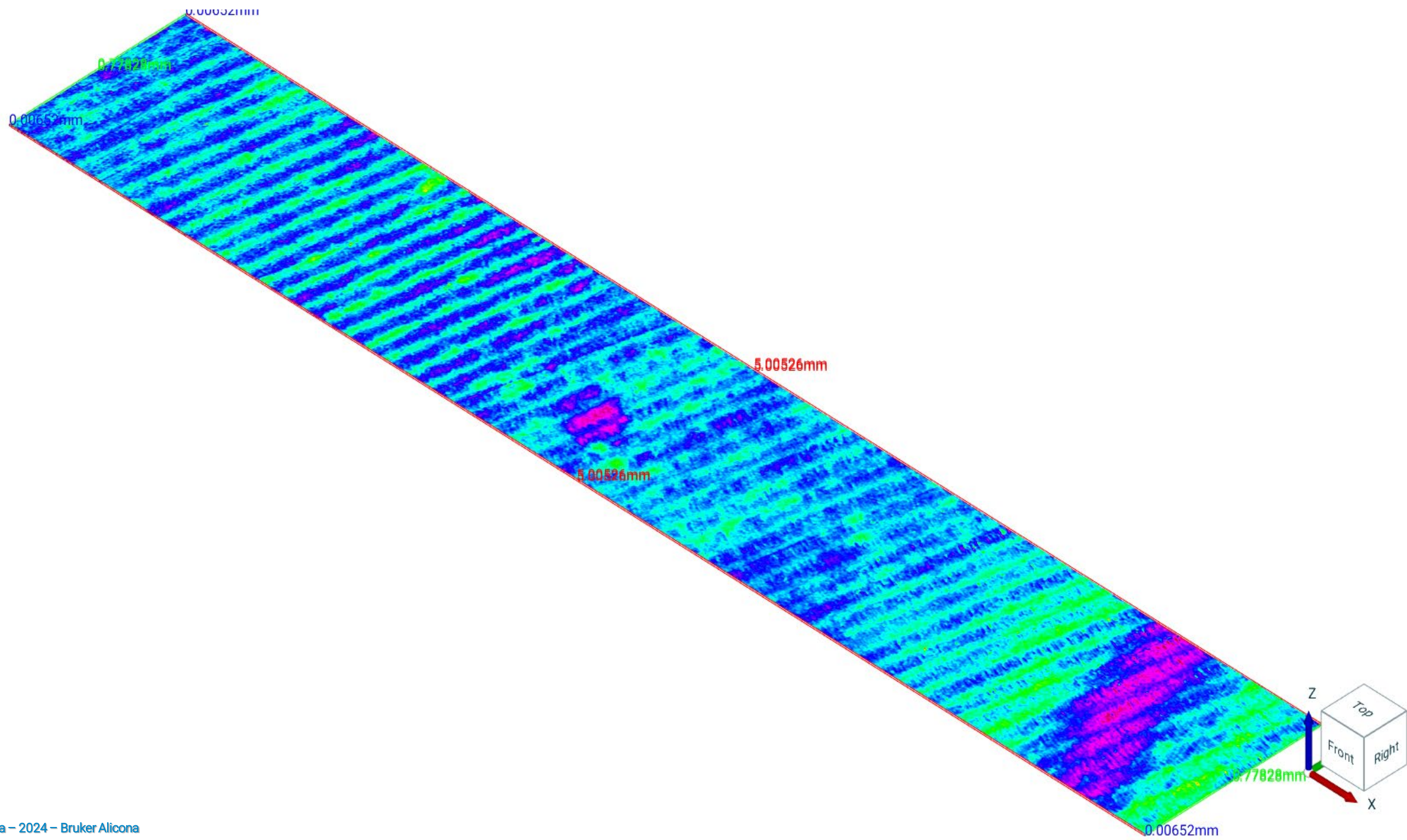
Profile 1 Ra: 0.39896µm ✓

	Actual		
Ra	0.39896	µm	
Rq	0.49402	µm	
Rz	2.40611	µm	

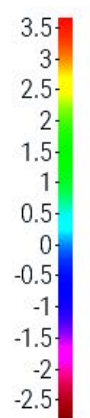


ONE CLICK ROUGHNESS



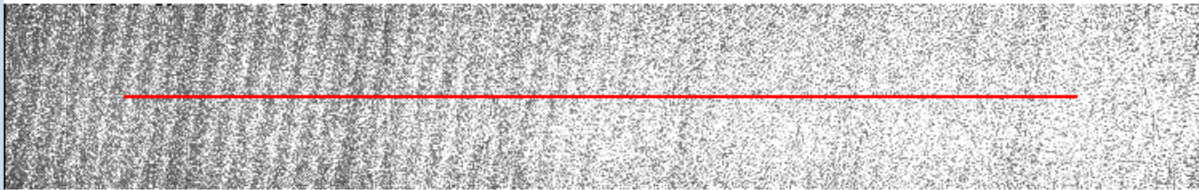
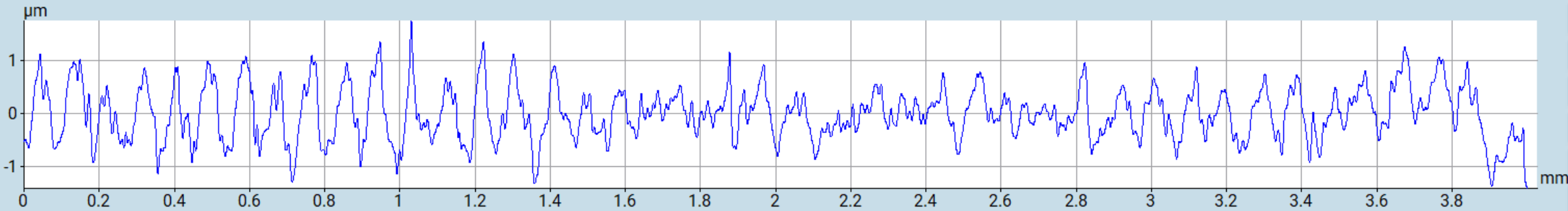


μm



Ra: 0.39896µm Rq: 0.49402µm Rz: 2.40611µm

Profile Length: 4.00000mm Lc: 0.80000mm



Name	Value	Unit	Status	Lower	Upper	Description
Ra	0.39896	µm	OK	0.00000	0.50000	Average roughness of profile
Rq	0.49402	µm	n.a.			Root-Mean-Square roughness of profile
Rz	2.40611	µm	n.a.			Mean peak to valley height of roughness profile
Rp	1.74398	µm	n.a.			Maximum peak height of roughness profile
Rv	1.41240	µm	n.a.			Maximum valley height of roughness profile
Rc	1.59523	µm	n.a.			Mean height of profile irregularities of roughness profile
Rsm	105.32399	µm	n.a.			Mean spacing of profile irregularities of roughness profile
Rsk	0.09777		n.a.			Skewness of roughness profile
Rku	2.75048		n.a.			Kurtosis of roughness profile
Rdq	0.05624		n.a.			Root-Mean-Square slope of roughness profile
Rt	3.15638	µm	n.a.			Maximum peak to valley height of roughness profile
Rmax	3.08931	µm	n.a.			Maximum peak to valley height of roughness profile within a sampling length
RtToRz	1.31182		n.a.			Extreme Scratch/Peak value of roughness profile, (>=1), higher values represent

Objective: 400 WD19, Profile Width: 1.8µm, Form Removal: Polynomial 4th Degree

