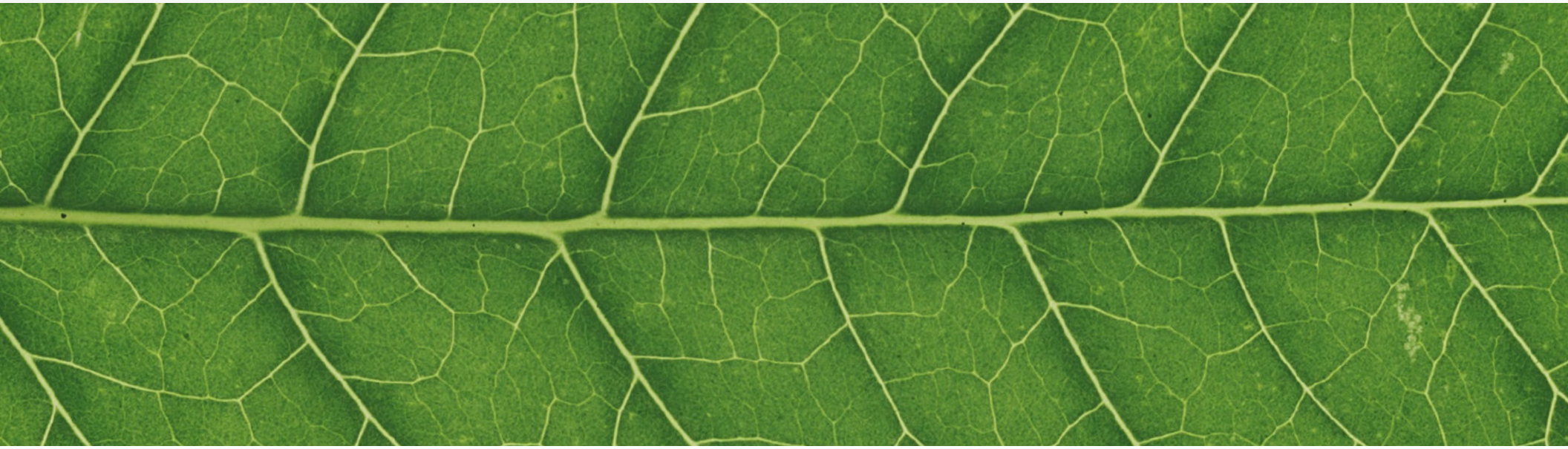
NANOVEA

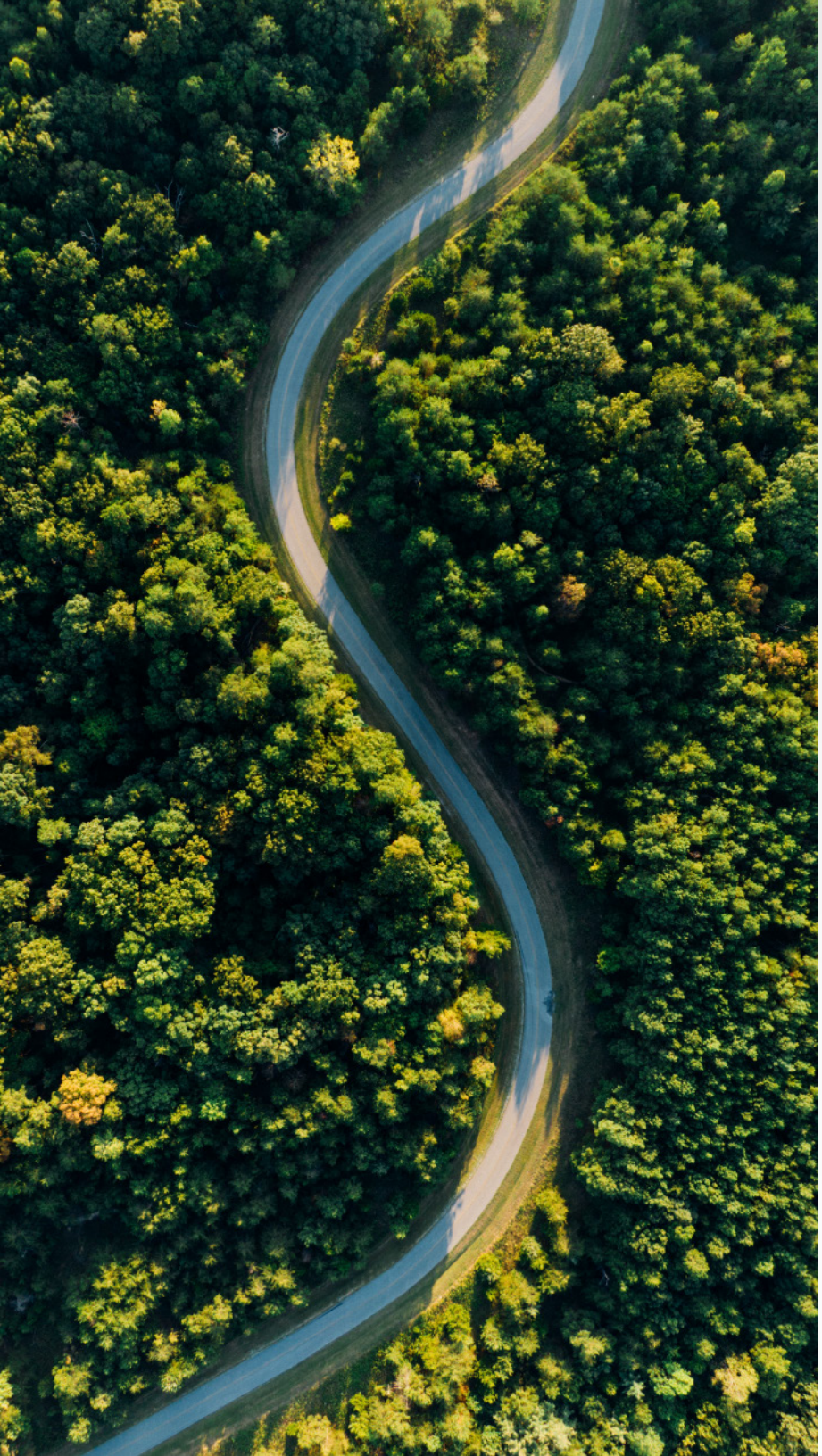
ORGANIC SURFACE TOPOGRAPHY

USING PORTABLE 3D PROFILOMETER



Prepared by

CRAIG LEISING



INTRODUCTION

Nature has become a vital pool of inspiration for the development of improved surface structure. Understanding the surface structures found in nature has led to adhesion studies based on gecko's feet, resistance studies based on a sea cucumbers textural change and repellency studies based from leaves, among many others. These surfaces have a number of potential applications from biomedical to clothing and automotive. For any of these surface breakthroughs to be successful, fabrication techniques must be developed so surface characteristics can be mimicked and reproduced. It is this process that will require identification and control.

IMPORTANCE OF PORTABLE 3D NON-CONTACT OPTICAL PROFILER FOR ORGANIC SURFACES

Utilizing Chromatic Light technology, the ***NANOVEA*** Jr25 Portable Optical Profiler has superior capability to measure nearly any material. That includes the unique and steep angles, reflective and absorbing surfaces found within natures broad range of surface characteristics. 3D non-contact measurements provide a full 3D image to give a more complete understanding of surface features. Without 3D capabilities, identification of nature's surfaces would be solely relying on 2D information or microscope imaging, which does not provide sufficient information to properly mimic the surface studied. Understanding the full range of the surface characteristics including texture, form, dimension, among many others, will be critical to successful fabrication.

The ability to easily obtain lab-quality results in the field opens the door for new research opportunities.

MEASUREMENT OBJECTIVE

*In this application, the **NANOVEA** Jr25 is used to measure the surface of a leaf. There is an endless list of surface parameters that can be automatically calculated after the 3D surface scan.*

Here we will review the 3D surface and select areas of interest to further analyze, including quantifying and investigating the surface roughness, channels and topography.

CLICK HERE TO LEARN MORE ABOUT THE INSTRUMENT

NANOVEA
Jr25

THE RESULTS

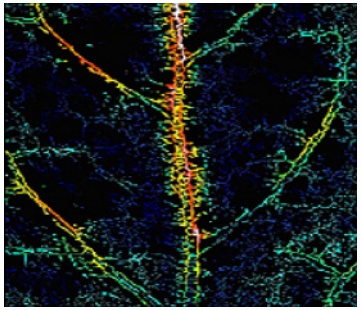
ISO 25178

HEIGHT PARAMETERS

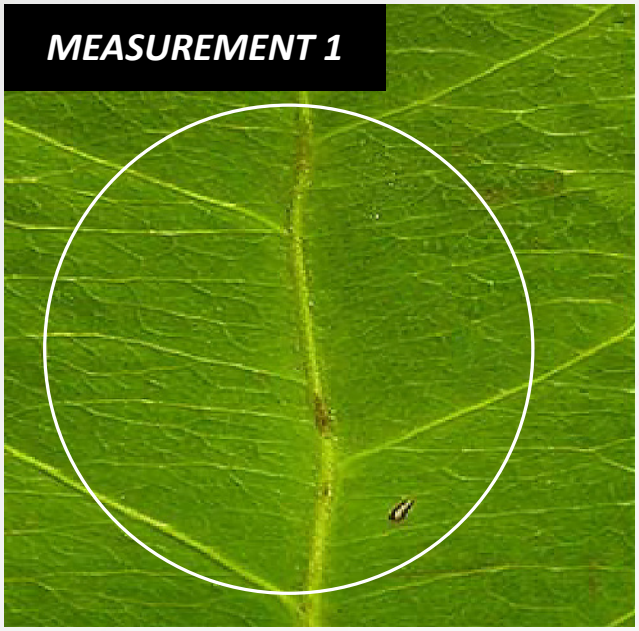
Sq	2.161 µm	Sku	3.371	Sv	12.372 µm	Sa	1.700 µm
Ssk	-0.163	Sp	10.729 µm	Sz	23.100 µm		

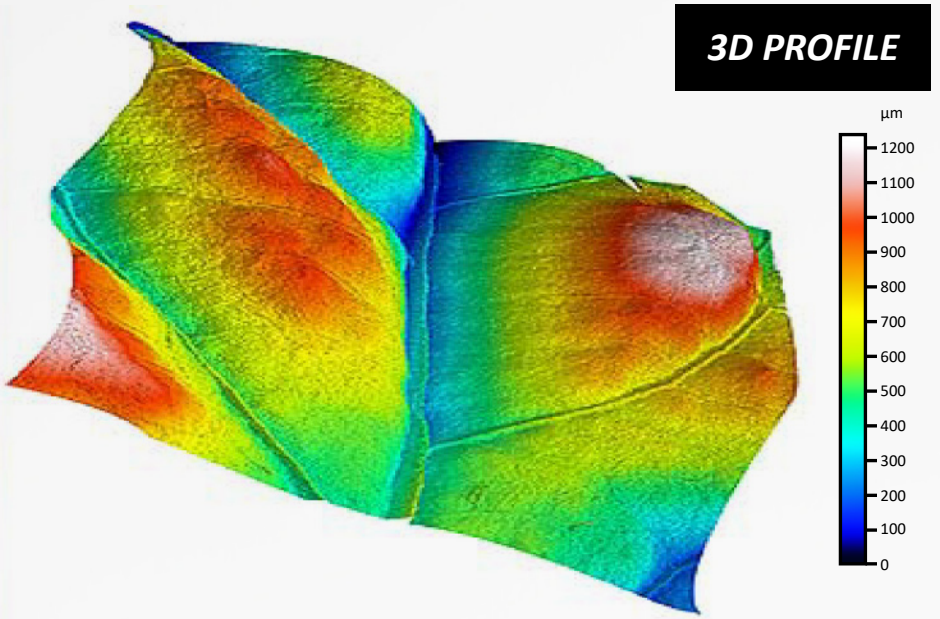
FURROW DEPTH

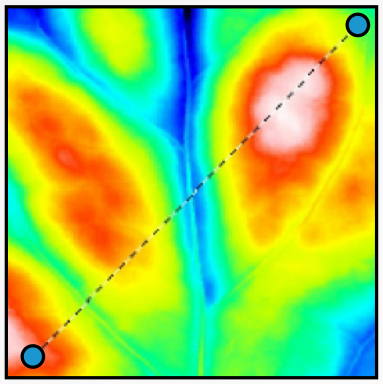
Mean density of furrows: 16.471 cm/cm²
Mean depth of furrows: 97.428 µm
Maximum depth: 359.769 µm

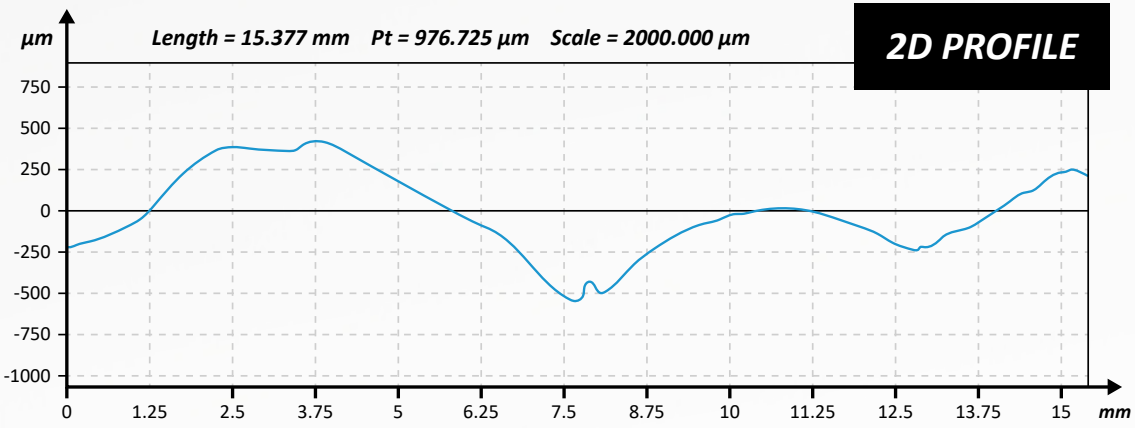


* *the sample*

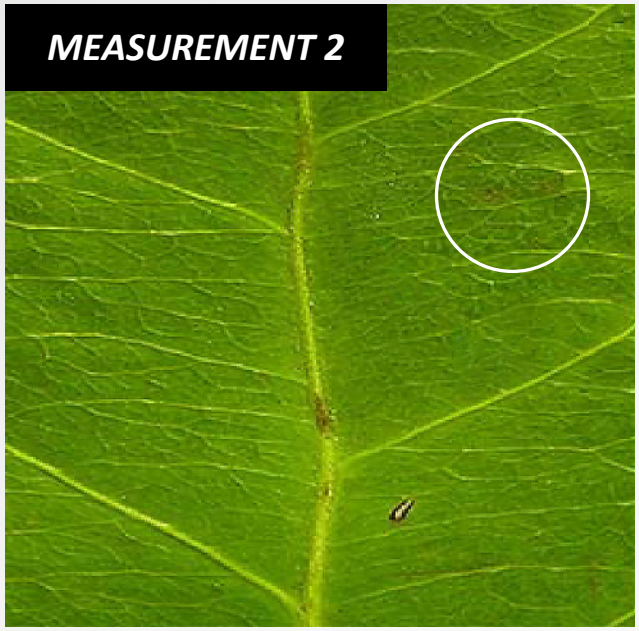

MEASUREMENT 1


3D PROFILE
µm
1200
1100
1000
900
800
700
600
500
400
300
200
100
0

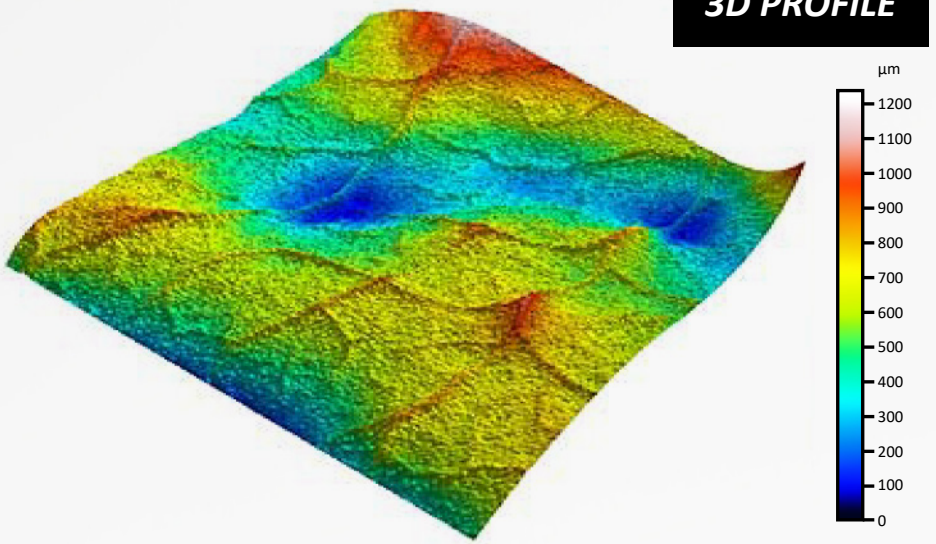


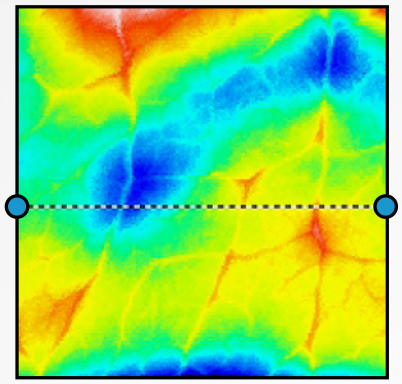

2D PROFILE
µm
Length = 15.377 mm
Pt = 976.725 µm
Scale = 2000.000 µm
750
500
250
0
-250
-500
-750
-1000
0
1.25
2.5
3.75
5
6.25
7.5
8.75
10
11.25
12.5
13.75
15
mm

MEASUREMENT 2

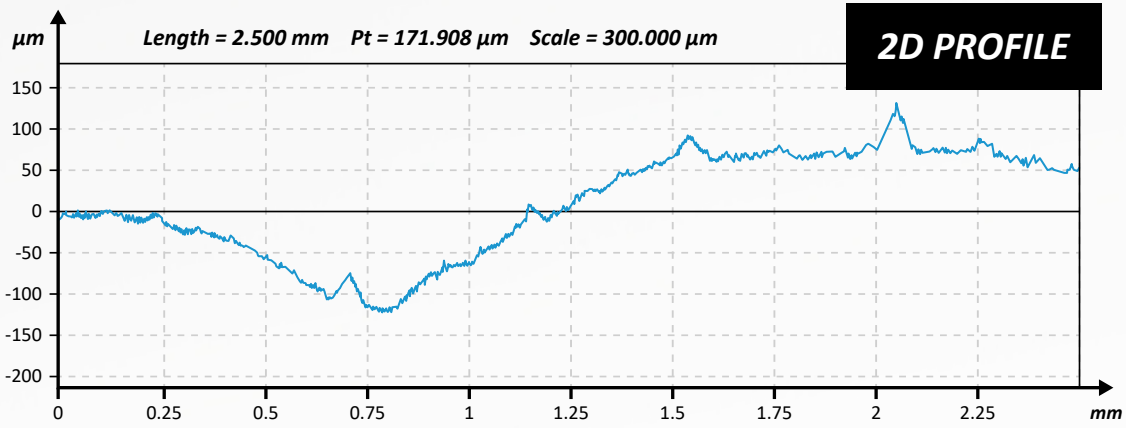


3D PROFILE

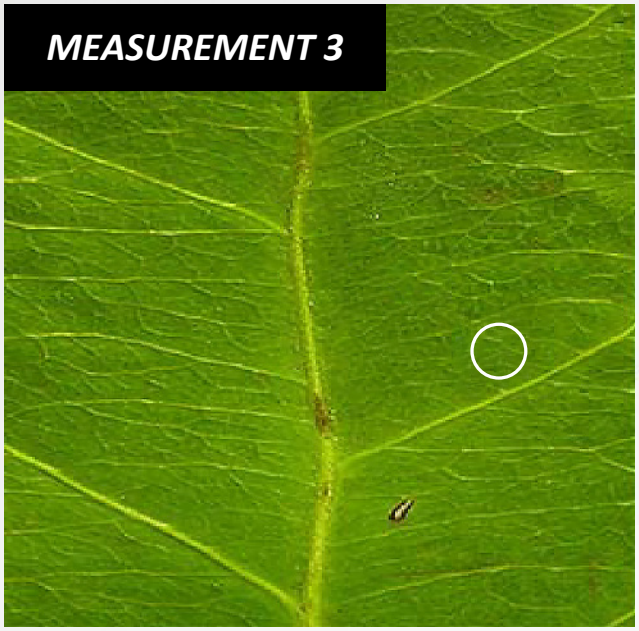




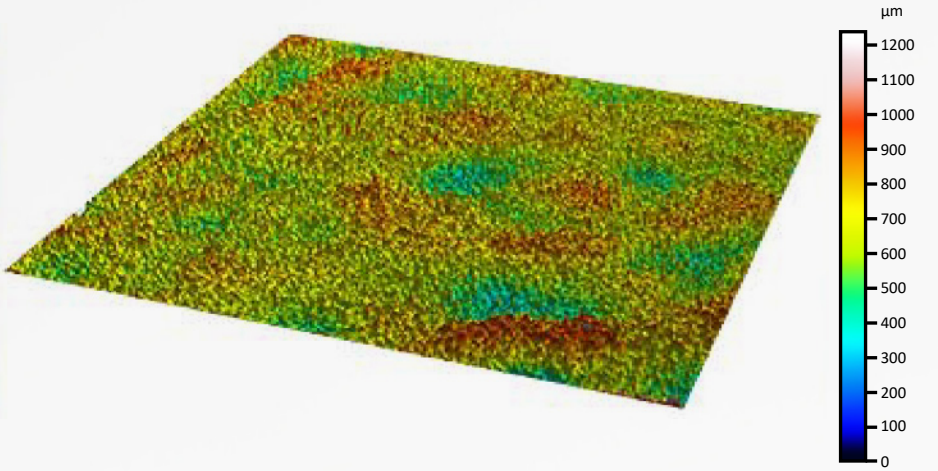
2D PROFILE

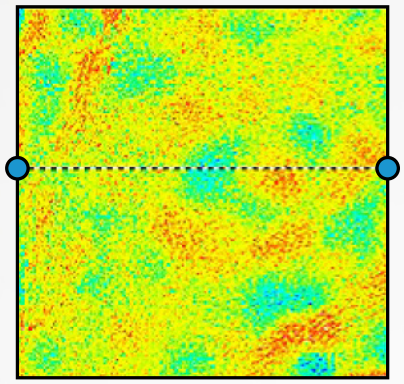


MEASUREMENT 3

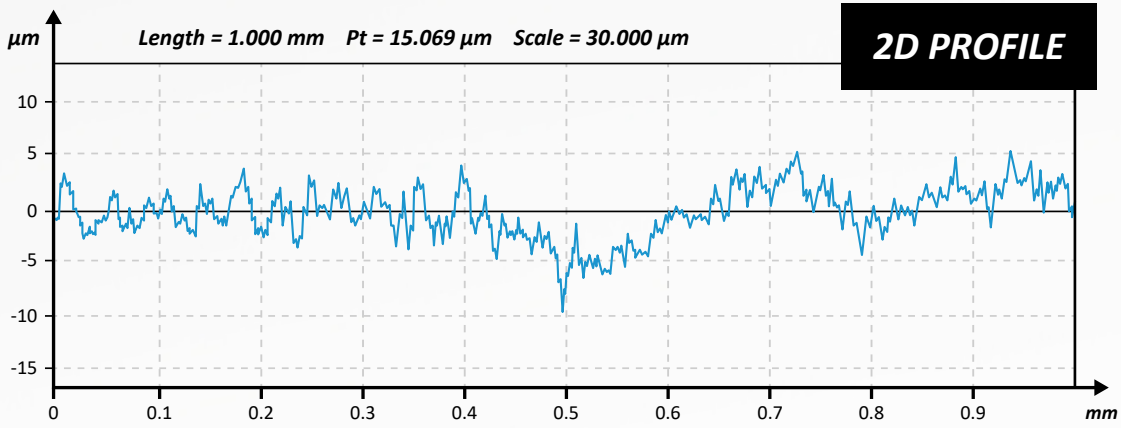


3D PROFILE





2D PROFILE



CONCLUSION

In this application, we have shown how the ***NANOVEA*** Jr25 portable 3D Non-Contact Optical Profiler can precisely characterize both the topography and the nanometer scale details of a leaf surface in the field. From these 3D surface measurements, areas of interest can quickly be identified and then analyzed with a list of endless studies (***Dimension, Roughness Finish Texture, Shape Form Topography, Flatness Warpage Planarity, Volume Area, Step-Height*** and others). A 2D cross section can be easily chosen to analyze further details. With this information organic surfaces can be broadly investigated with a complete set of surface measurement resources. Special areas of interest could have been further analyzed with integrated AFM module on table top models.

NANOVEA also offers portable high-speed profilometers for field research and a wide range of lab-based systems, as well as provides laboratory services.

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