



Institute Dr. Schrader

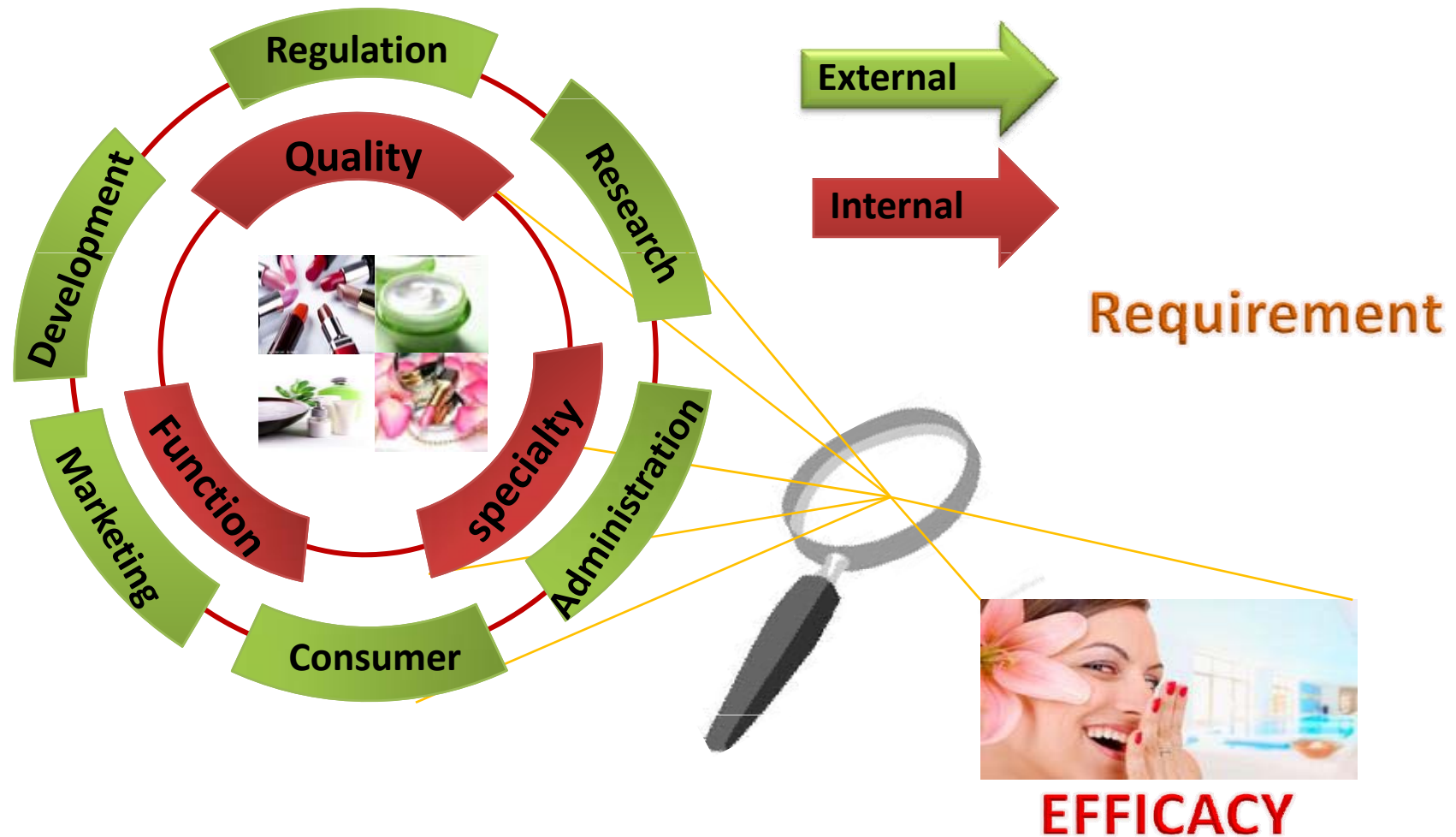
Biophysical Driven Effectiveness Testing for Functional Cosmetics

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Beijing Sino-German Union Cosmetic Institute

June. 26 Shang Hai

Background



Background



I want you to know me



Products



Enterprise



Industry



EFFICACY



I want to know you



Consumer



Market





How to get deep acknowledge of the cosmetics efficacy?

... ..

A effective and direct way

Biophysical Driven Effectiveness Testing



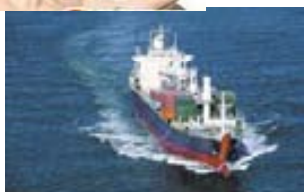
**Modern science
and technology**



**Basic theory
research**



**Development of
Dermatology**



**Global trade and
consumption**



Promote the **realization**
of **authentic** and **acceptable**
cosmetic efficacy evaluation

Biophysical measurement



Skin measurements

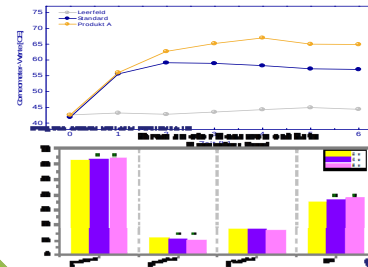


Digital Image Analysis



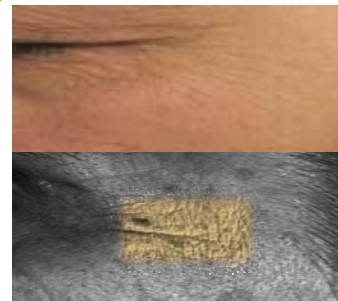
UV Protection

Kinetic Test

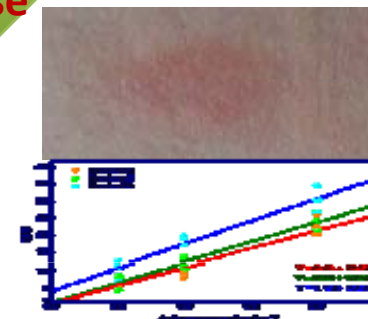


Skin Hydration
Skin Elasticity
Skin pH
Skin color
.....

Home in Use



Wrinkle
Pigmentation
Color
Texture
.....



SPF
PA
Water resistance
.....



A Further Research Demonstration

Anti-wrinkle performance of cosmetic products differentiated by FOITS

FOITS



Technique

Analysis / Parameter

Superimposition

Age

Ethnic Background

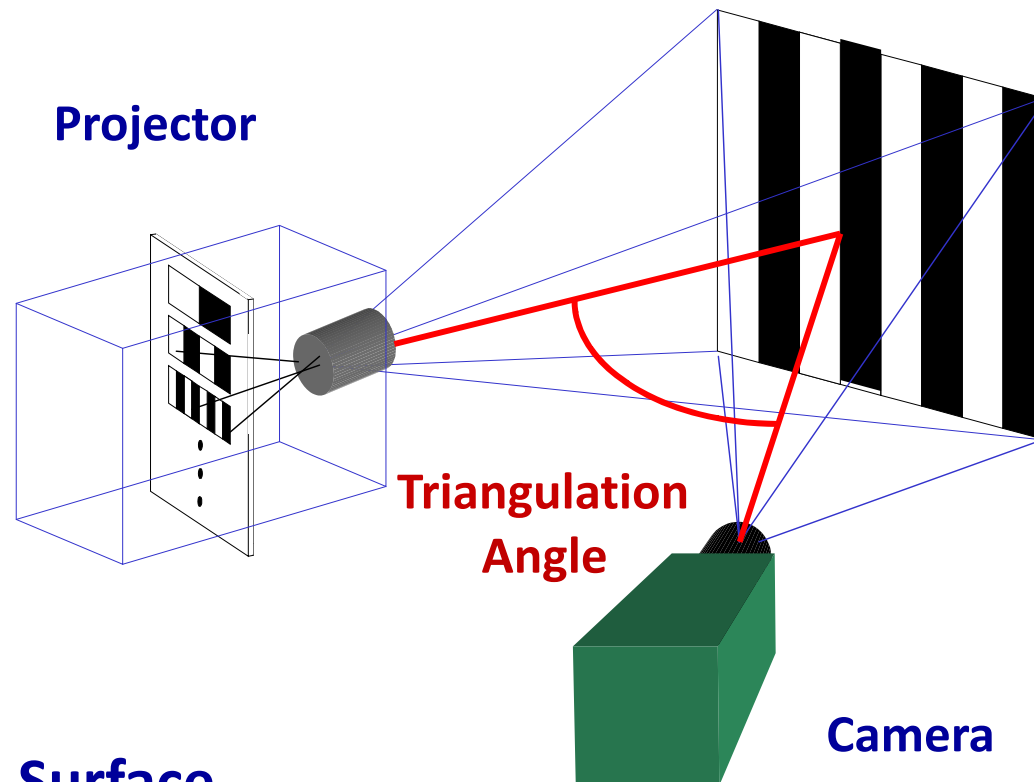
Technique

FOITS

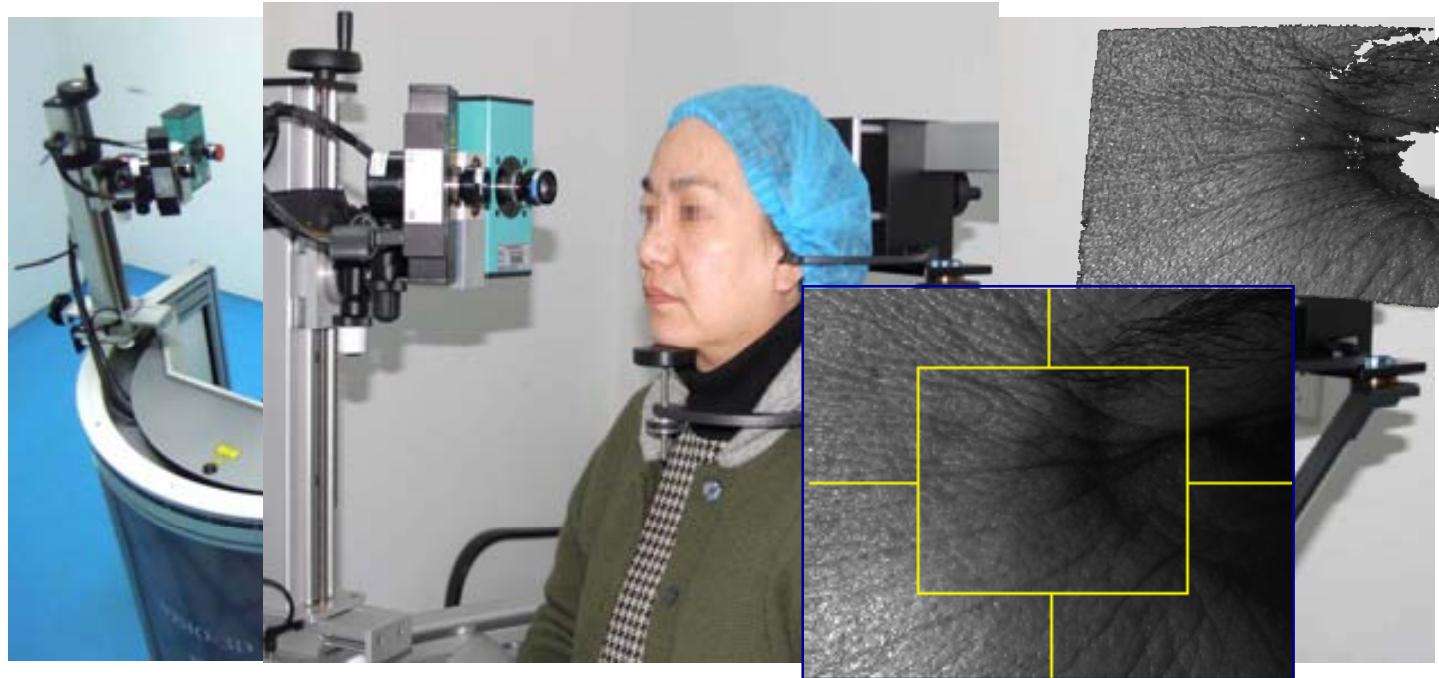


Fast Optical In vivo Topometry of Human Skin

- Optical
- Touch Free
- Real Time
- 3D-Analysis of Skin Surface
- Fringe Projection



FOITS

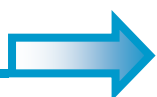


Area **40 x 30 mm**

Resolution X/Y **~ 30 μ m**

Resolution Z **4 μ m**

Depth of Focus **20 mm**

Technique **Blue LED** 

Phase Shift / Gray Code

Time

200 ms / 500 ms

FOITS



History

Technique

Analysis / Parameter

Superimposition

Age

Ethnic Background

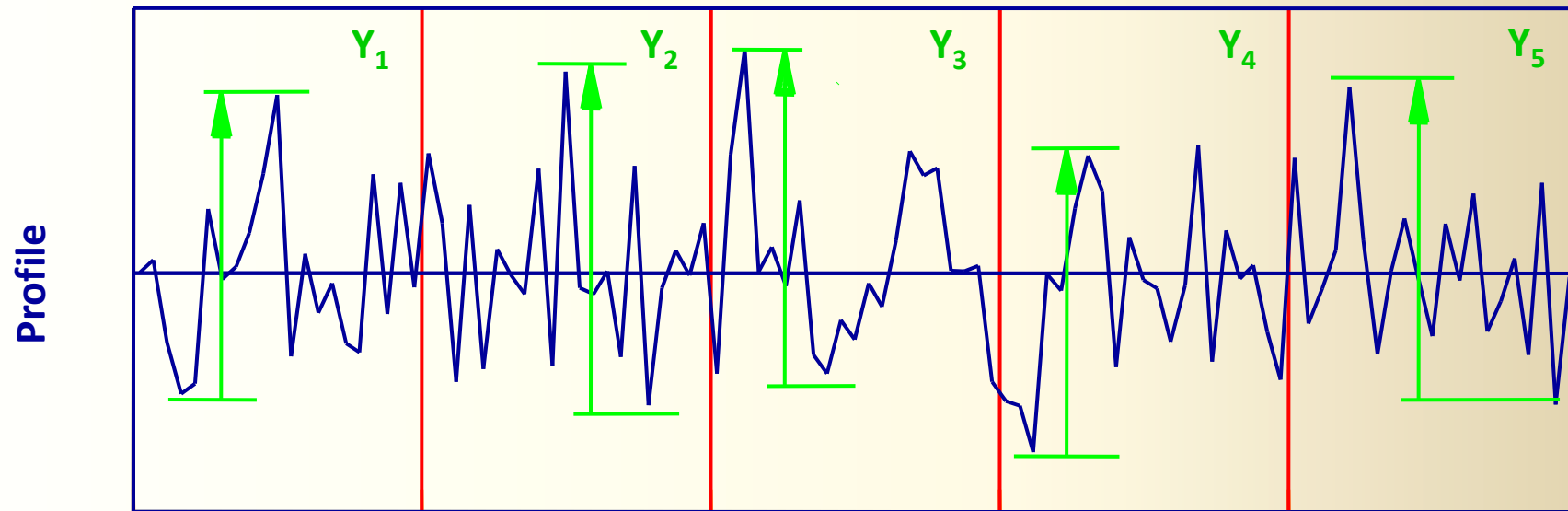
Analysis / Parameter

FOITS – *Parameter*



➤ **Rz / DIN 4768/1**

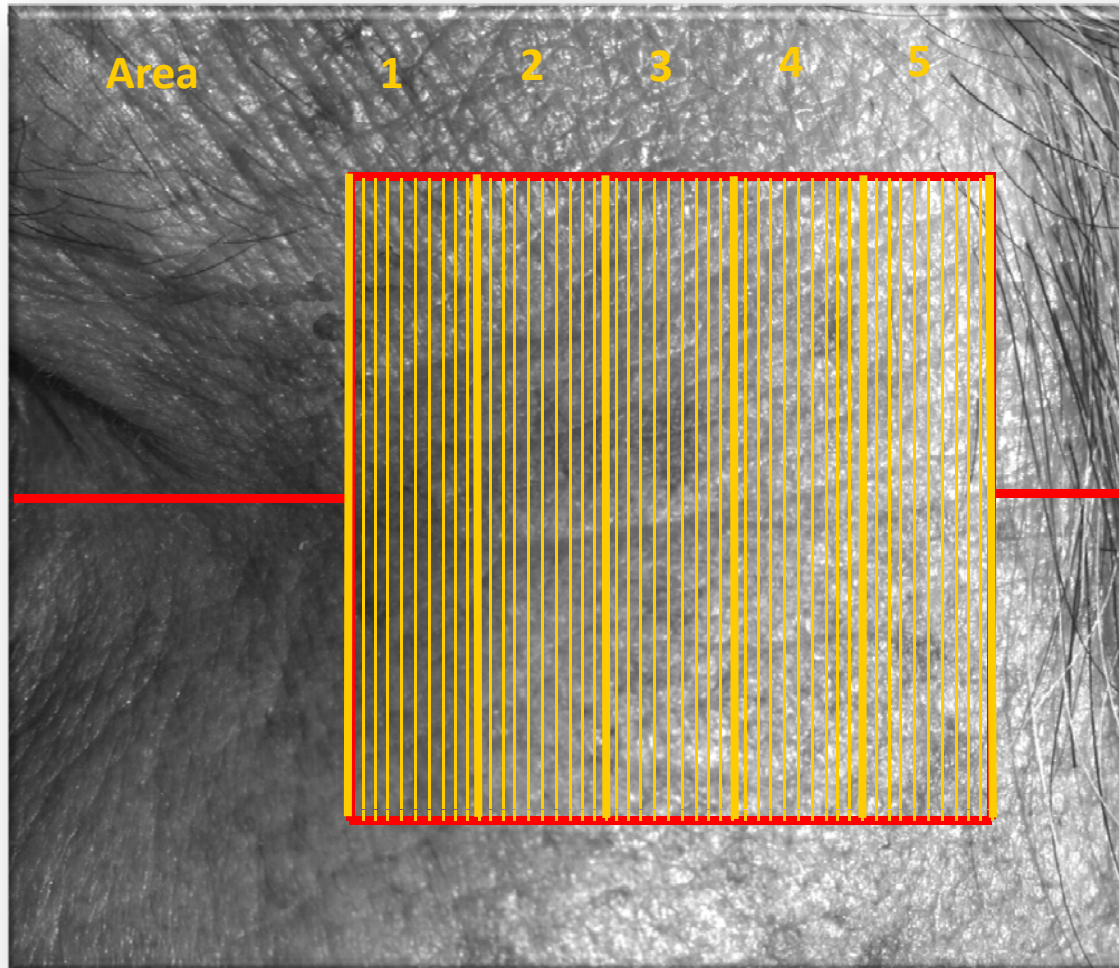
FOITS – Rz / DIN 4768-1



Y_i = Maximum Profile Difference (R_{max})

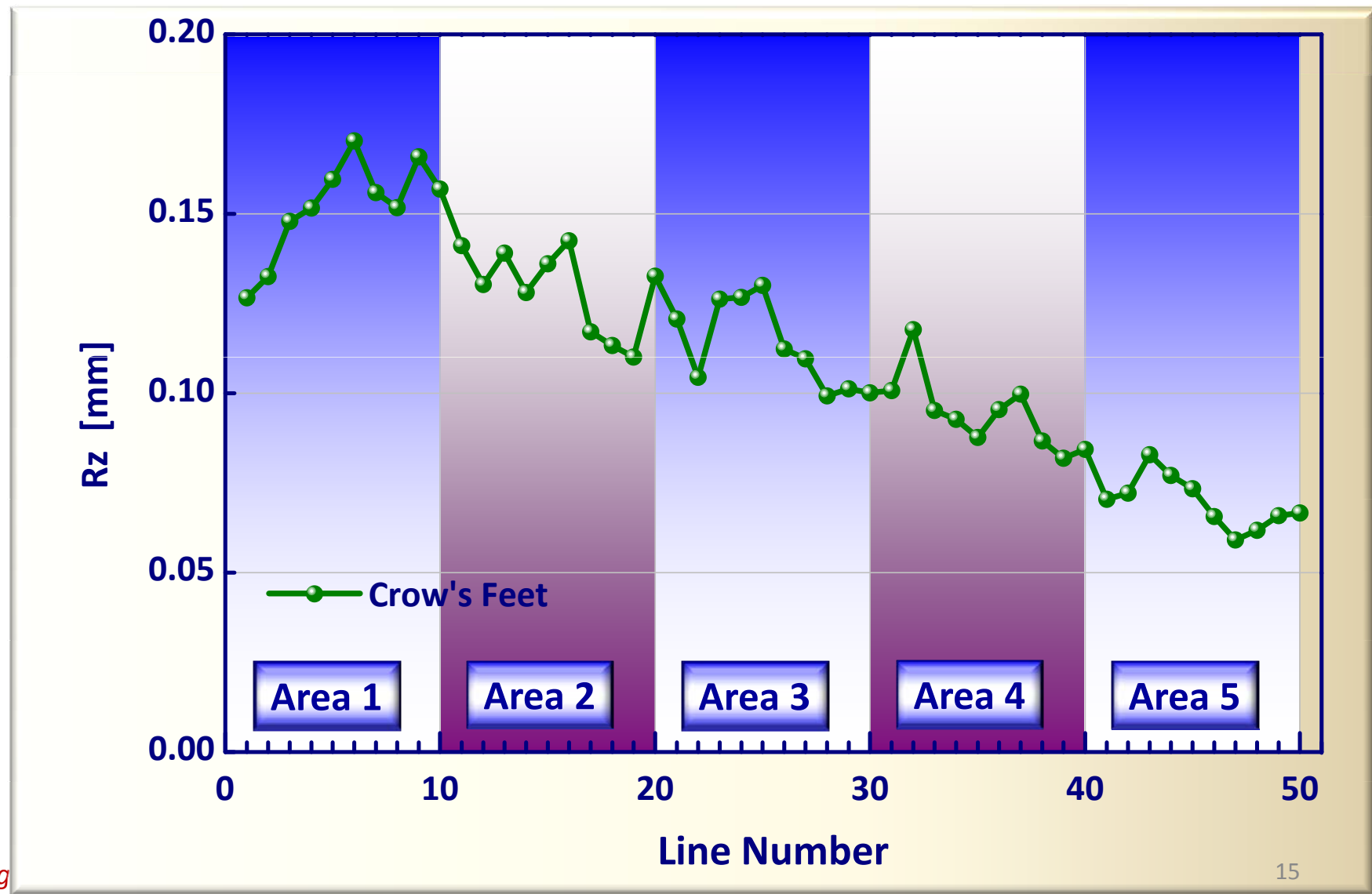
$$Rz = 1/5 \sum_{i=1}^5 Y_i$$

FOITS – Analysis of Crow's-Feet / *Rz*

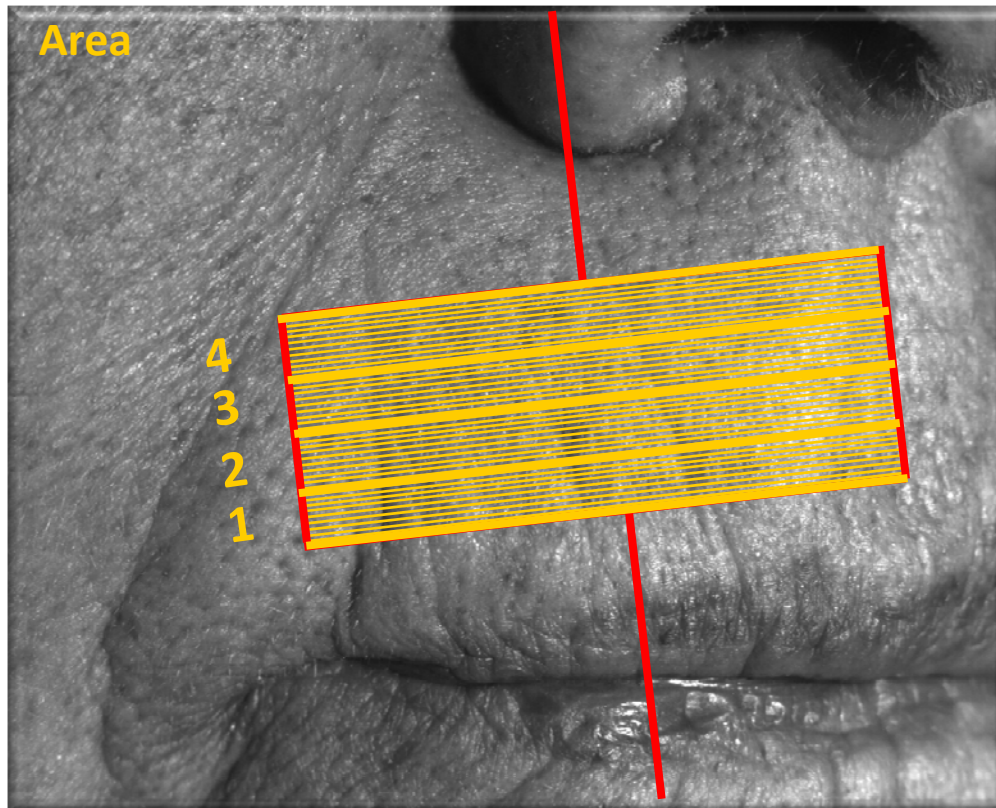


- Area 20x20 mm
- 50 Lines (400 μm space)
perpendicular to main
wrinkle direction
- Definition of 5 Areas
- Analysis of *Rz*
by ANOVA

FOITS – Rz / Line Number / Crow's Feet

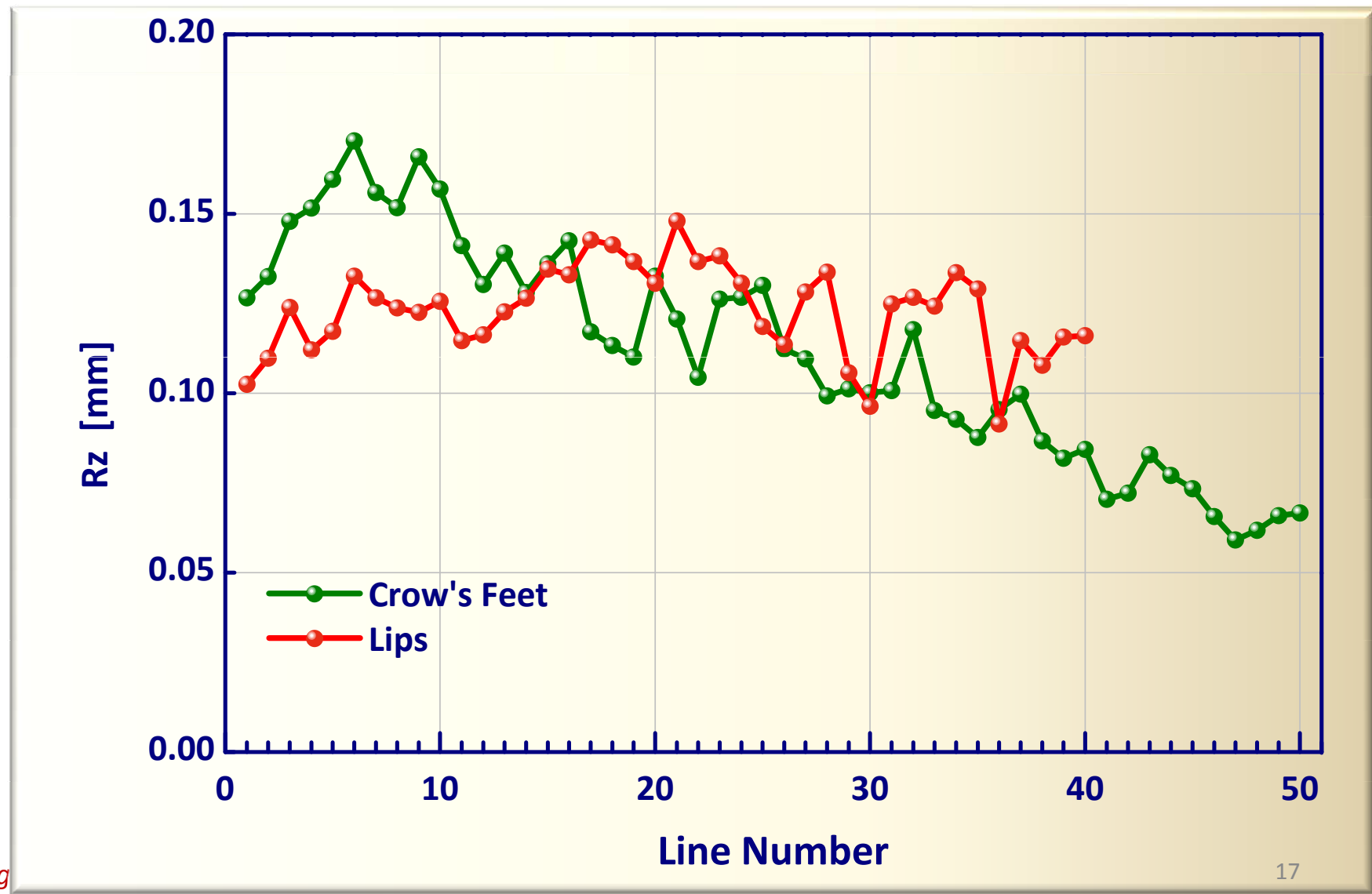


FOITS – Analysis of Lips / Rz

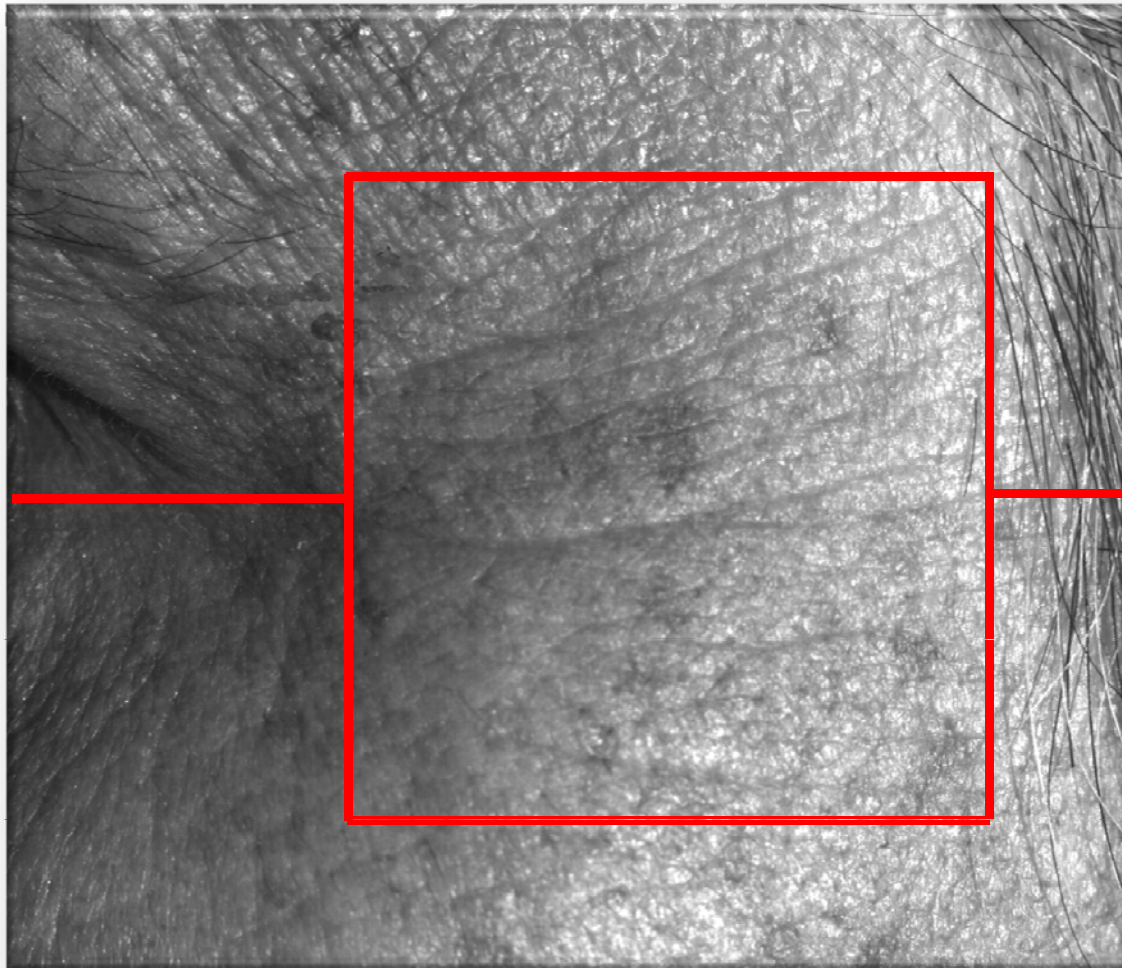


- Area 10x20 mm
- 40 Lines (250 μ m space)
perpendicular to main
wrinkle direction
- Definition of 4 Areas
- Analysis of Rz
by ANOVA

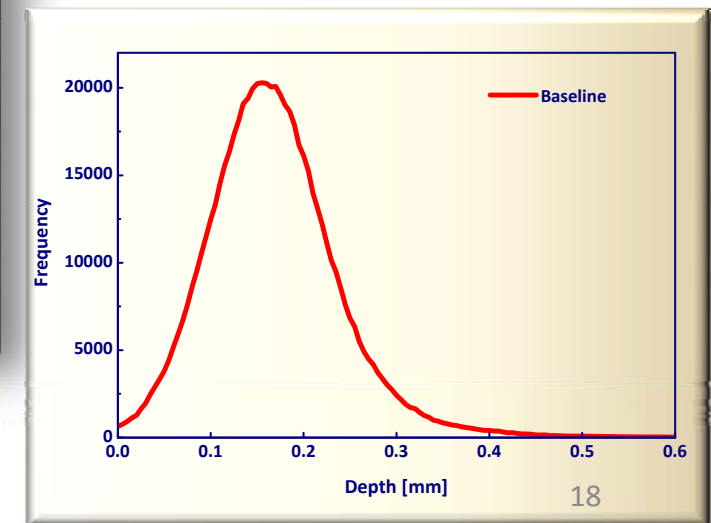
FOITS – *Rz / Line Number / Lips*



FOITS – Analysis of Crow's-Feet / FDD



- Area 20x20 mm
- approx.
640.000 single values
- Frequency Distribution
of Depth << FDD >>



FOITS – *Parameter*



➡ Rz / DIN 4768/1

➡ **Analysis**

➡ **Rz / Sub Area (1-5) / FDD**

➡ **- Basic analysis to quantify product effectiveness
- Detailed profile of product effectiveness**

➡ **Statistical relevant background from FOITS data**

FOITS



History

Technique

Analysis / Parameter

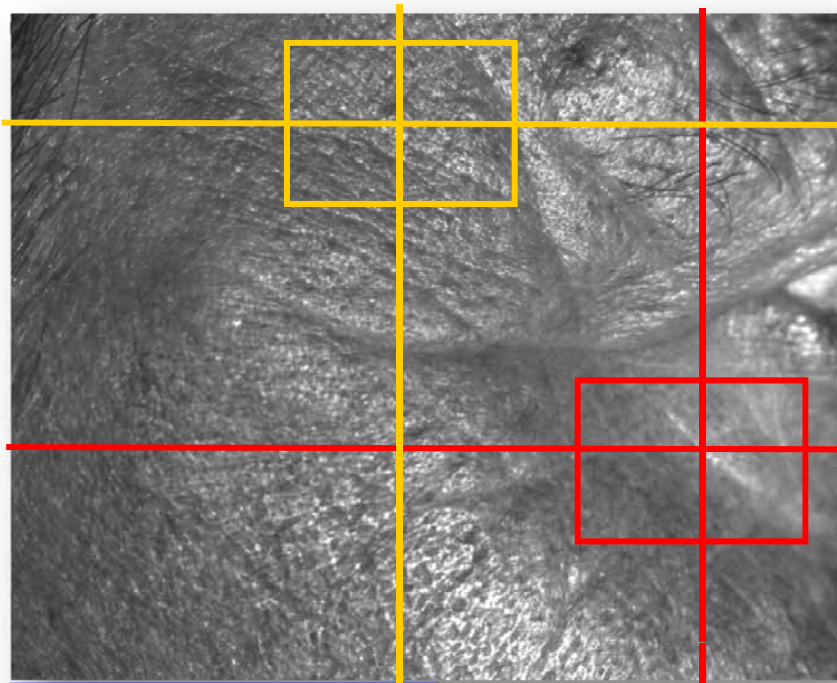
Superimposition

Age

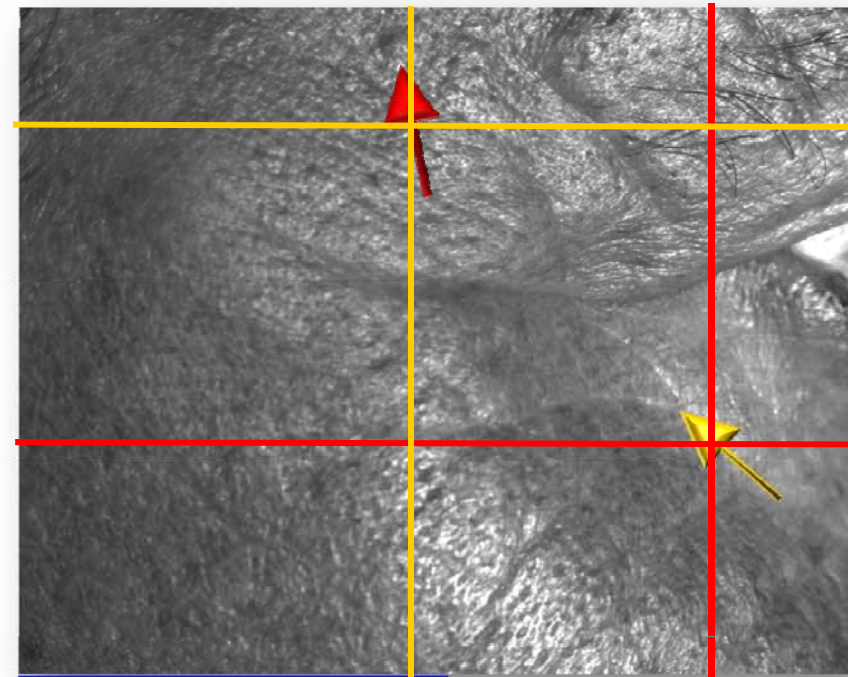
Ethnic Background

Superimposition

FOITS – *Superimposition*



Measurement 1

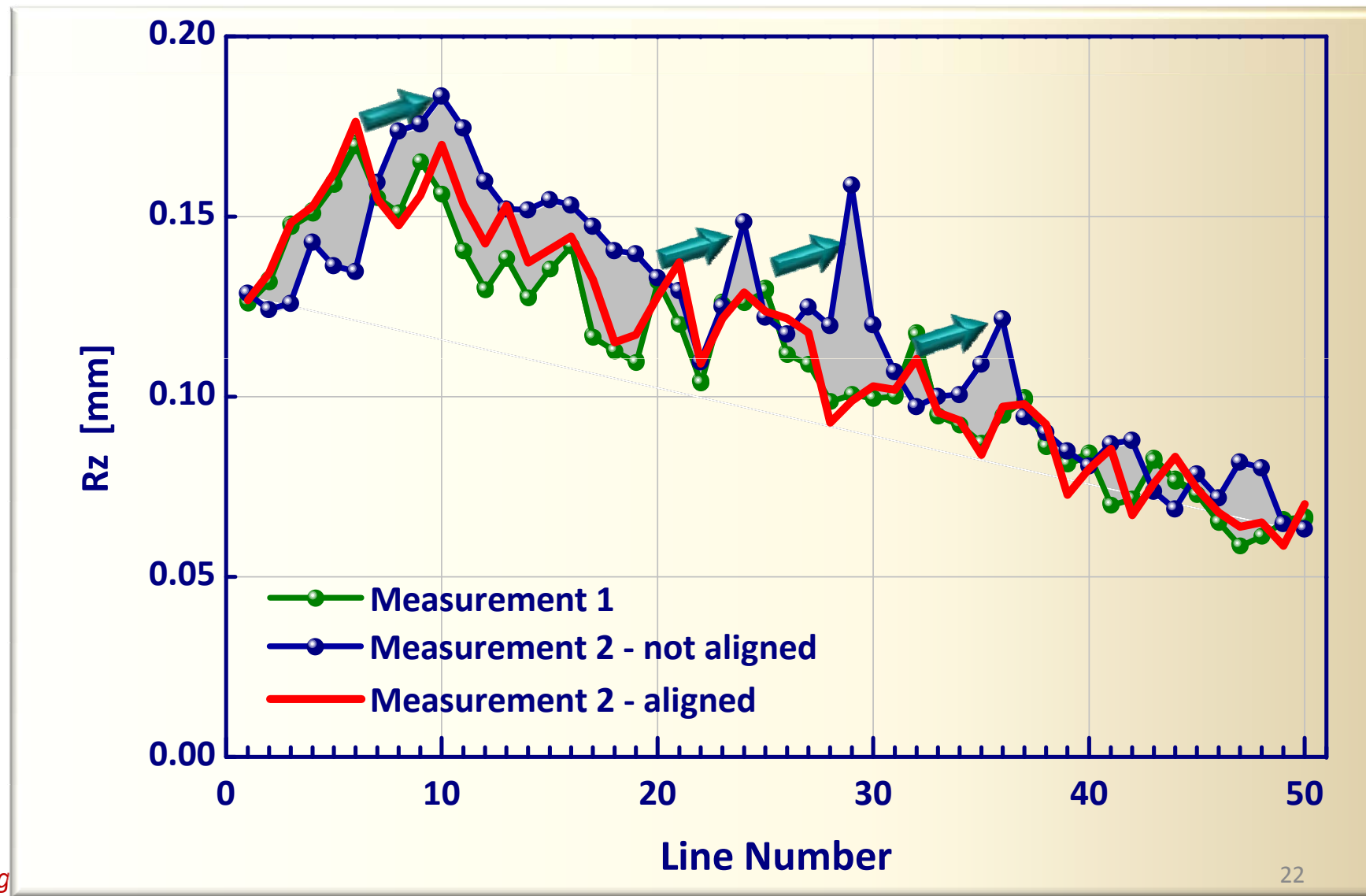


Measurement 2



**Superimposition has to take care for
SHIFT and ROTATION**

FOITS – Superimposition / Rz



FOITS – *Superimposition*



- A good measurement starts with an excellent “mechanical” superimposition!
- Nevertheless FOITS -2006
opens the possibility to compensate a
mechanical “dis-alignment” nearly by 100%!

FOITS



History

Technique

Analysis / Parameter

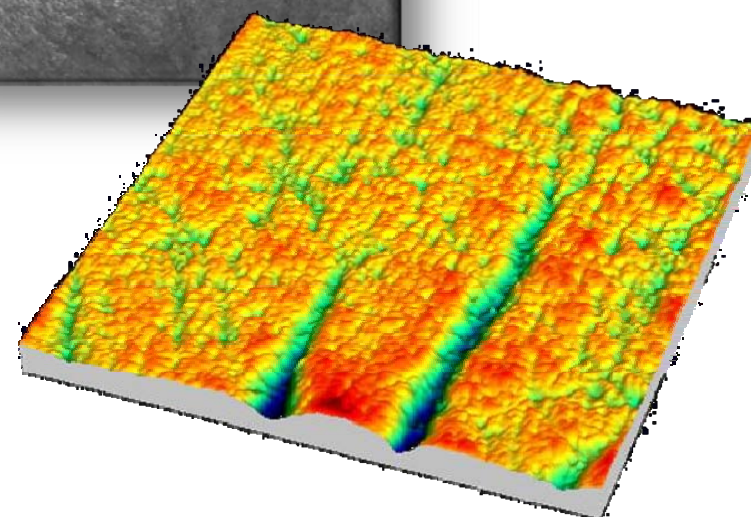
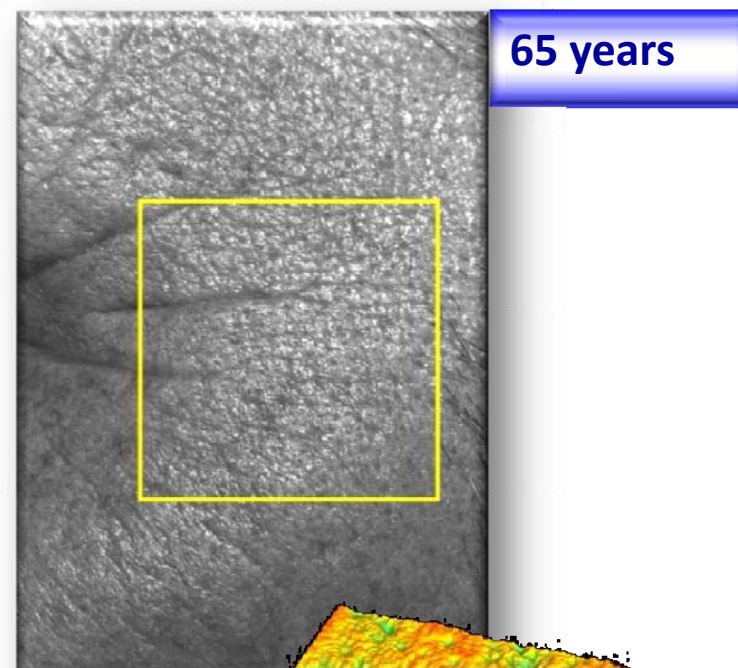
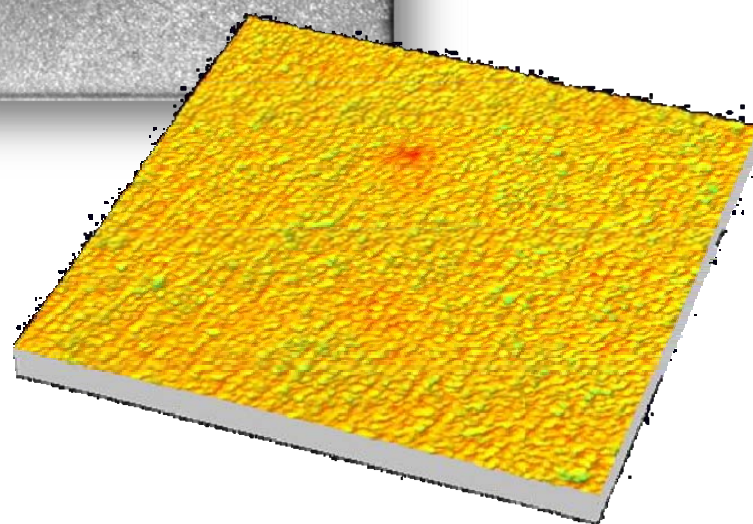
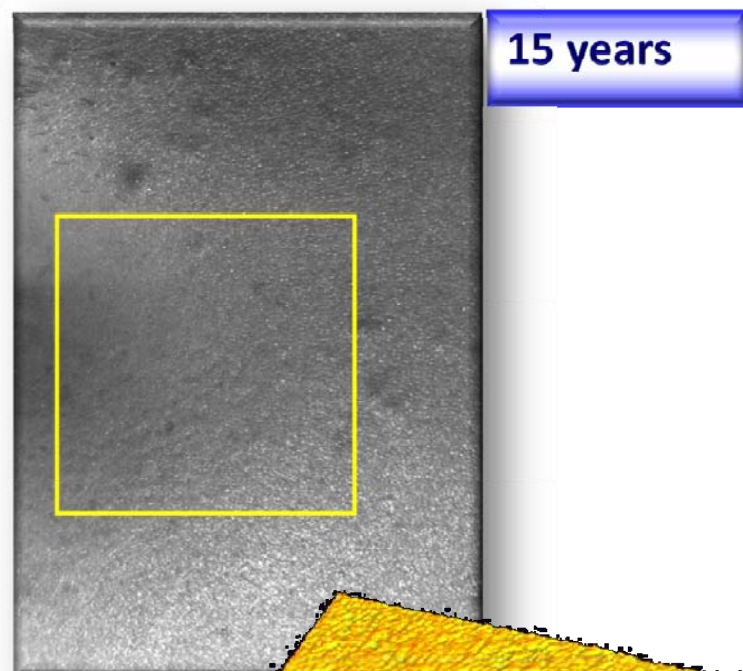
Superimposition

Age

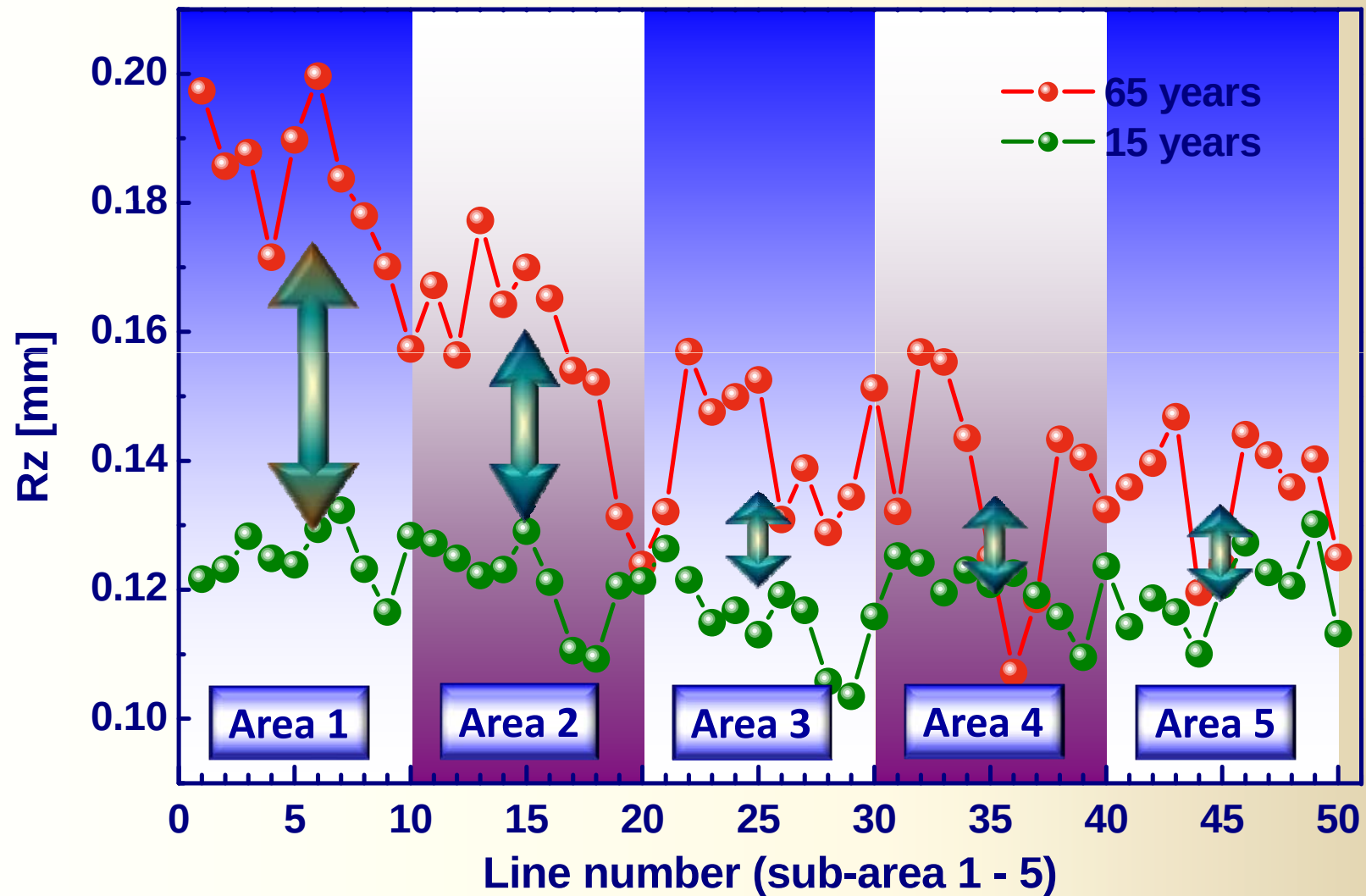
Ethnic Background

Age

FOITS – Age



FOITS – Rz / Line Number / Age



Ring

FOITS – Age / R_z



➡ R_z

- ➡ Exponential correlation at older age
- ➡ Flat correlation at younger age
- ➡ Main Differences in Area 1 and Area 2

FOITS – Age / R_z

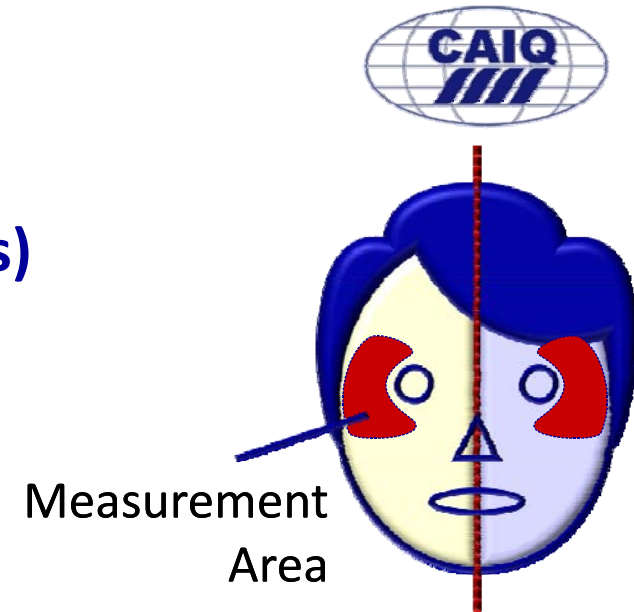


➤ R_z

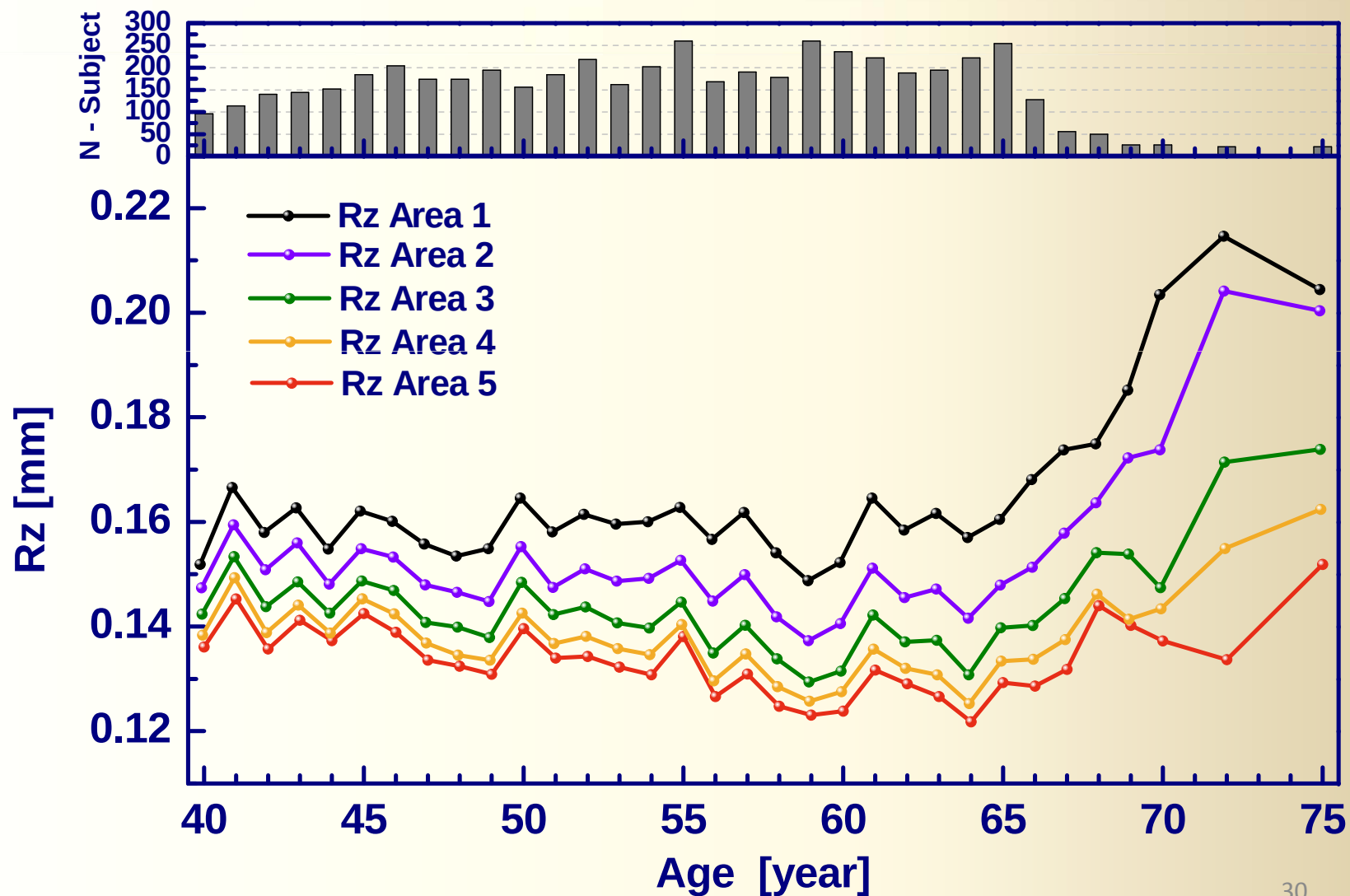
- ➔ Main Differences in Area 1 and Area 2
- ➔ Flat correlation at younger age
- ➔ Exponential correlation at older age

FOITS – Age / Rz

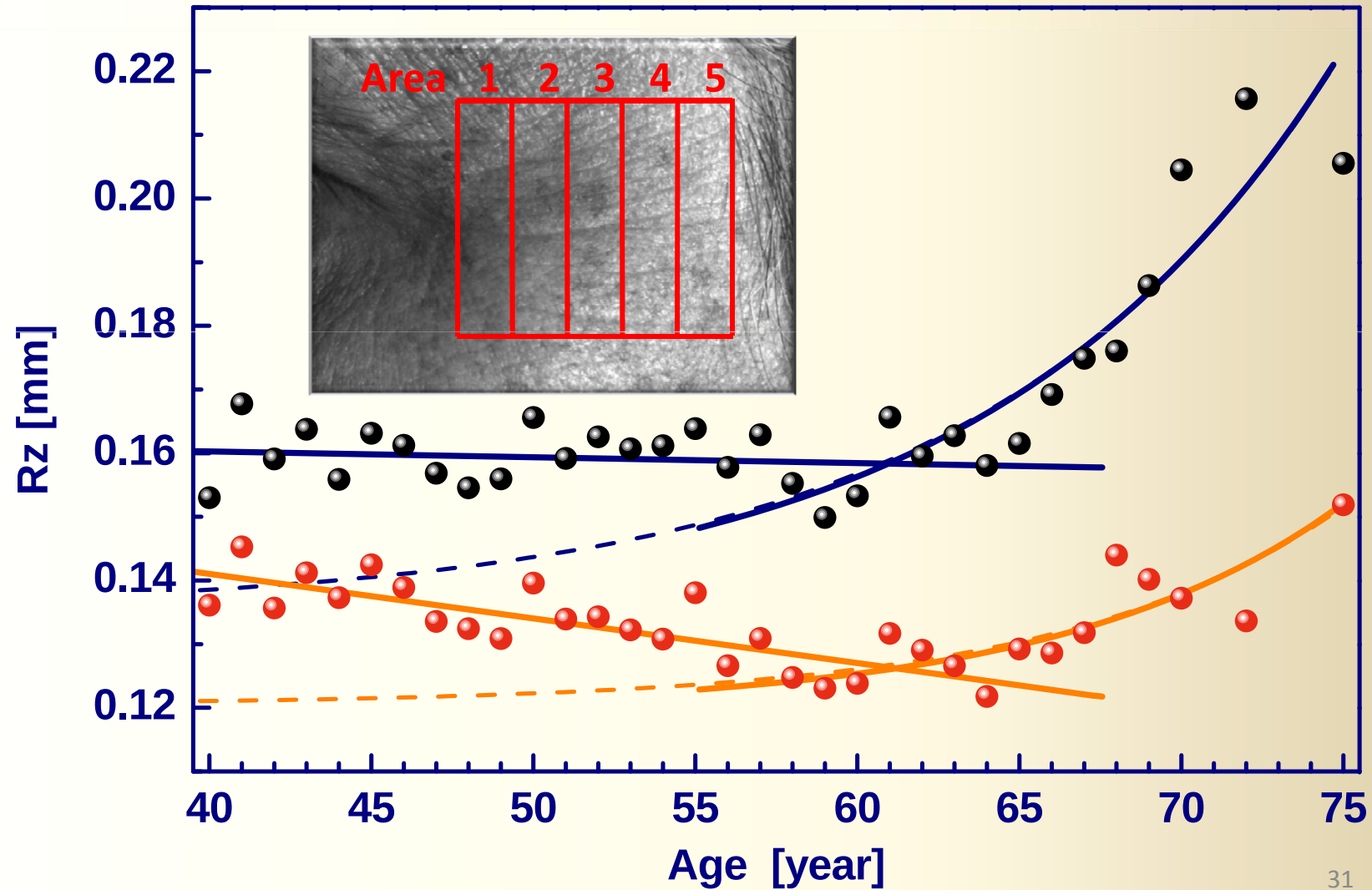
- ➡ Choose 2695 Subjects (5390 Eyes)
- ➡ Baseline analysis of **Rz**
(after 45 min - climatized Lab)
- ➡ Statistical analysis as a function of **Age**
- ➡ Statistical analysis as a function of **Sub-Area**



FOITS – Age / Rz / mean value per age / n=2695



FOITS – Age / Rz / mean value per age / n=2965

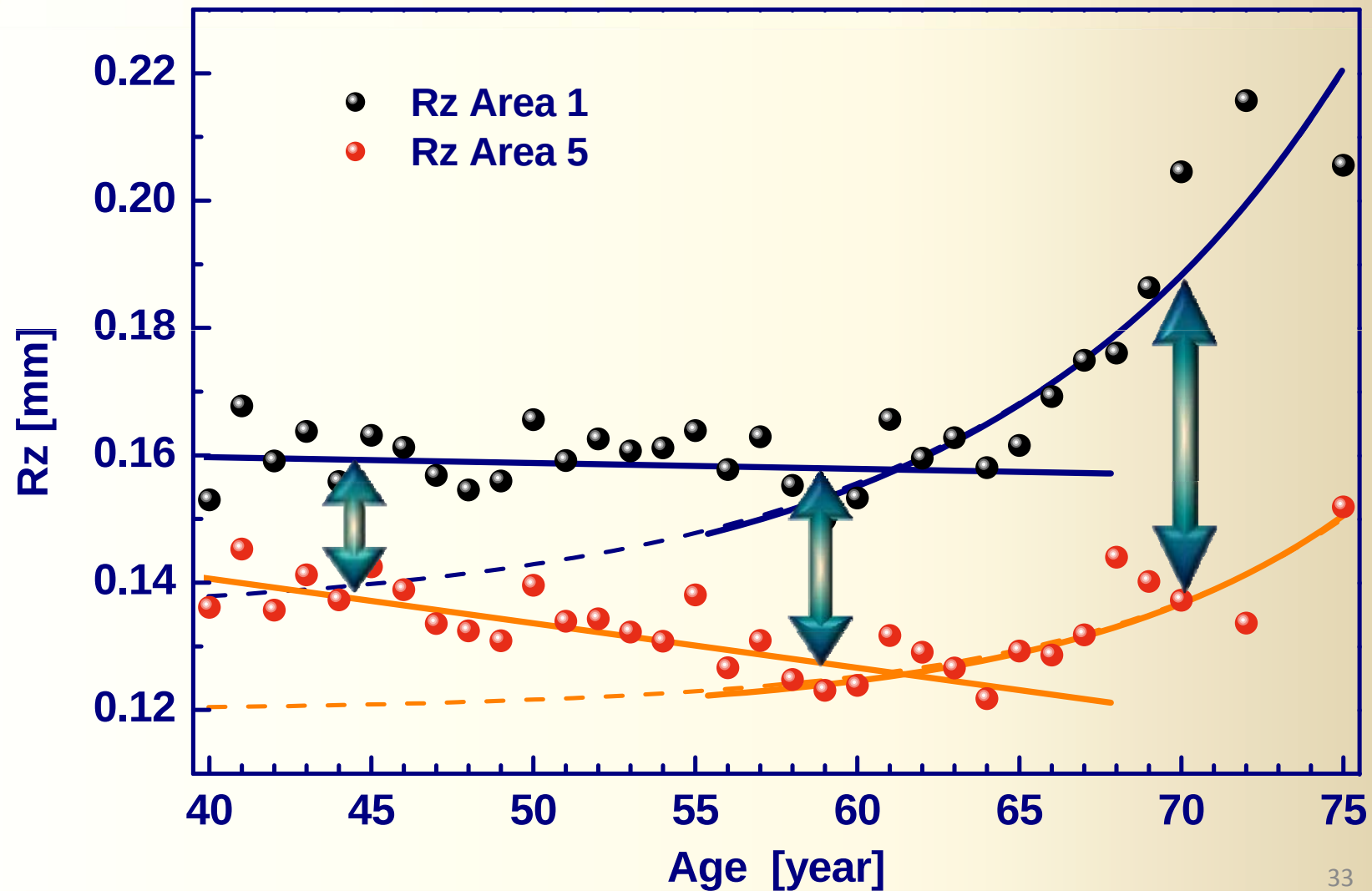


FOITS – Age / Rz / mean value per age / n=2965



- Panels consist of volunteers which are selected to take part in an anti aging study!
- Combination of Linear Fit and Exponential Fit
- Area 1 and Area 5 show a similar but not the same age dependency

FOITS – Age / Rz / mean value per age / n=2965

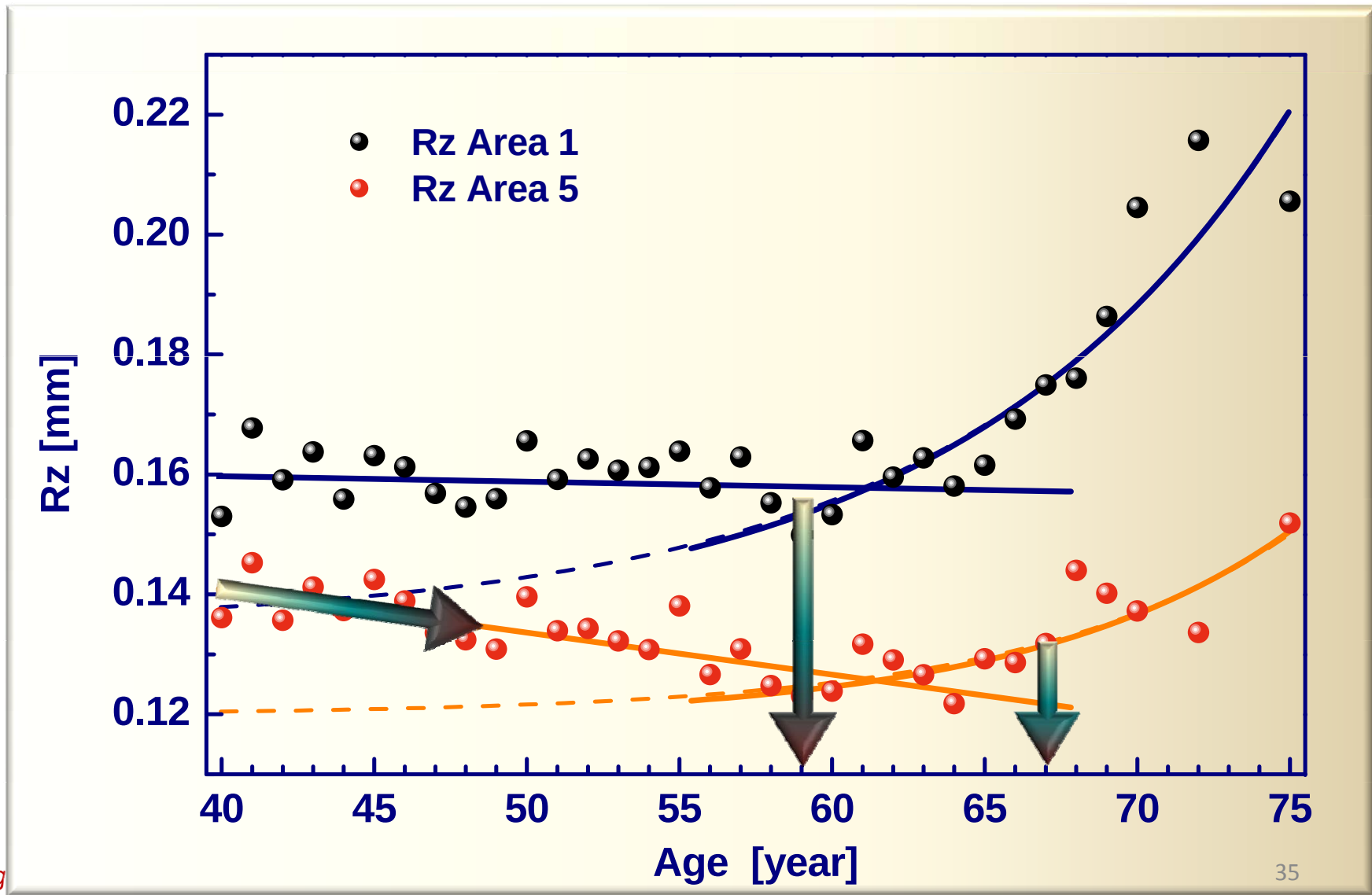


FOITS – Age / Rz / mean value per age / n=2965



- Panels consist of volunteers which are selected to take part in an anti aging study!
- Combination of Linear Fit and Exponential Fit
- Area 1 and Area 5 show a similar but
not the same age dependency
- **History of wrinkle formation**
differs with wrinkle deepness
- ➡ **Deeper structures seem to increase earlier
and stronger than finer structures**
- ➡ **If younger women have deeper wrinkles they
have a rougher skin structure at all**

FOITS – Age / Rz / mean value per age / n=2965



FOITS



History

Technique

Analysis / Parameter

Superimposition

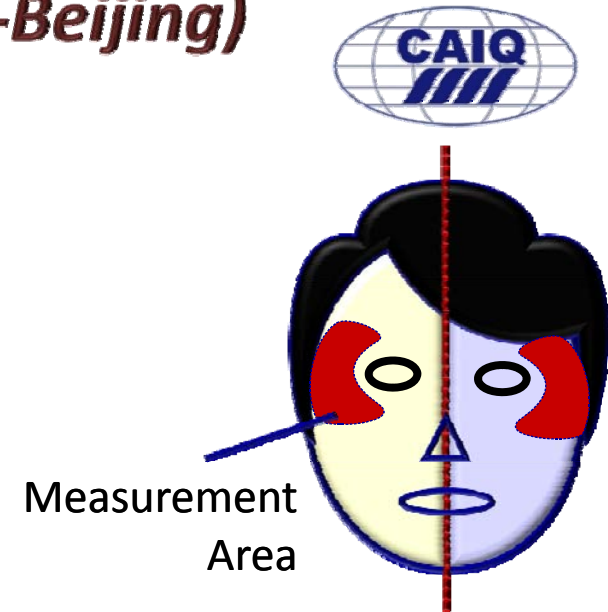
Age

Ethnic Background

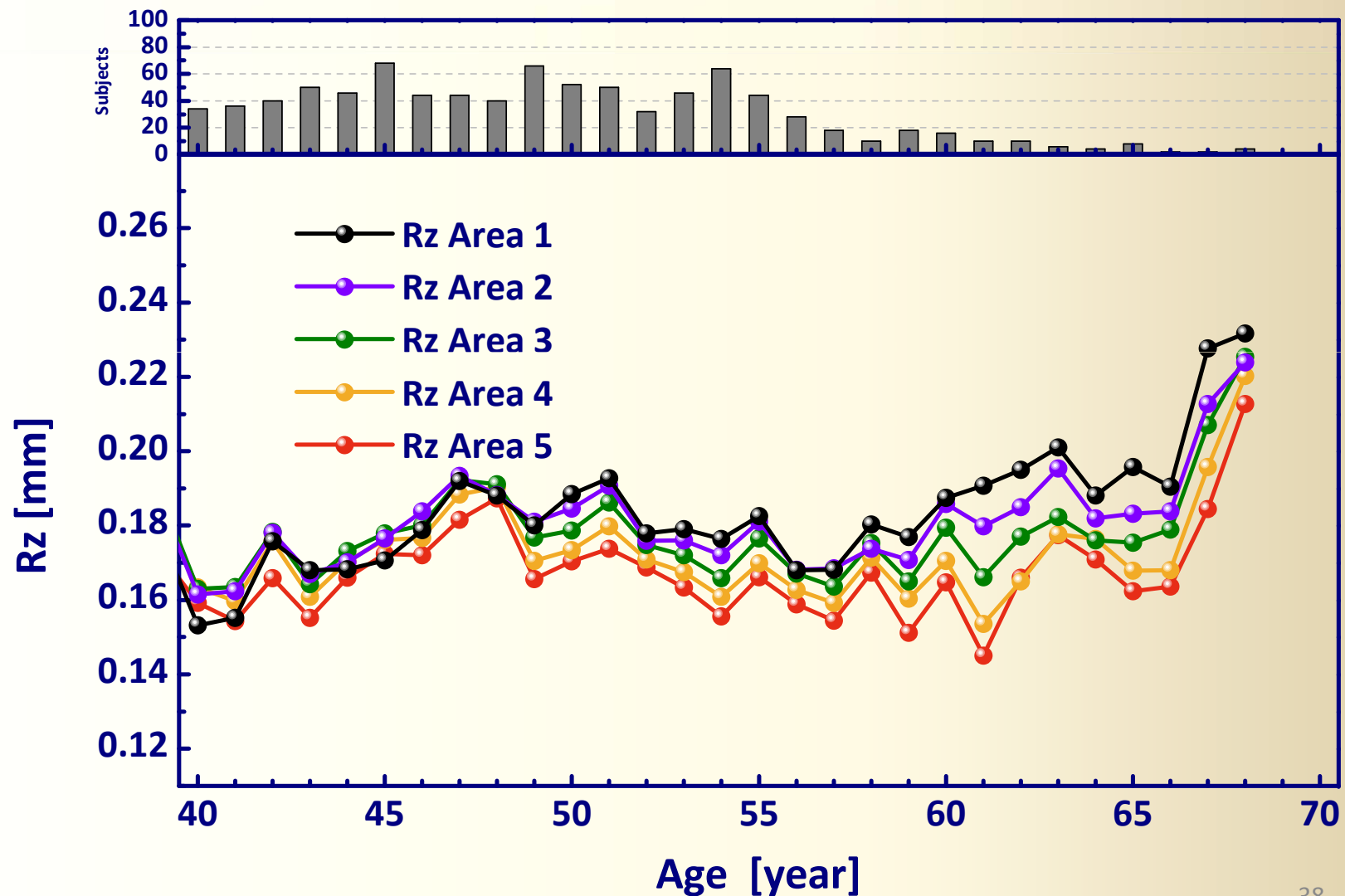
Ethnic Background

FOITS – Age / Rz / Asian Skin (China-Beijing)

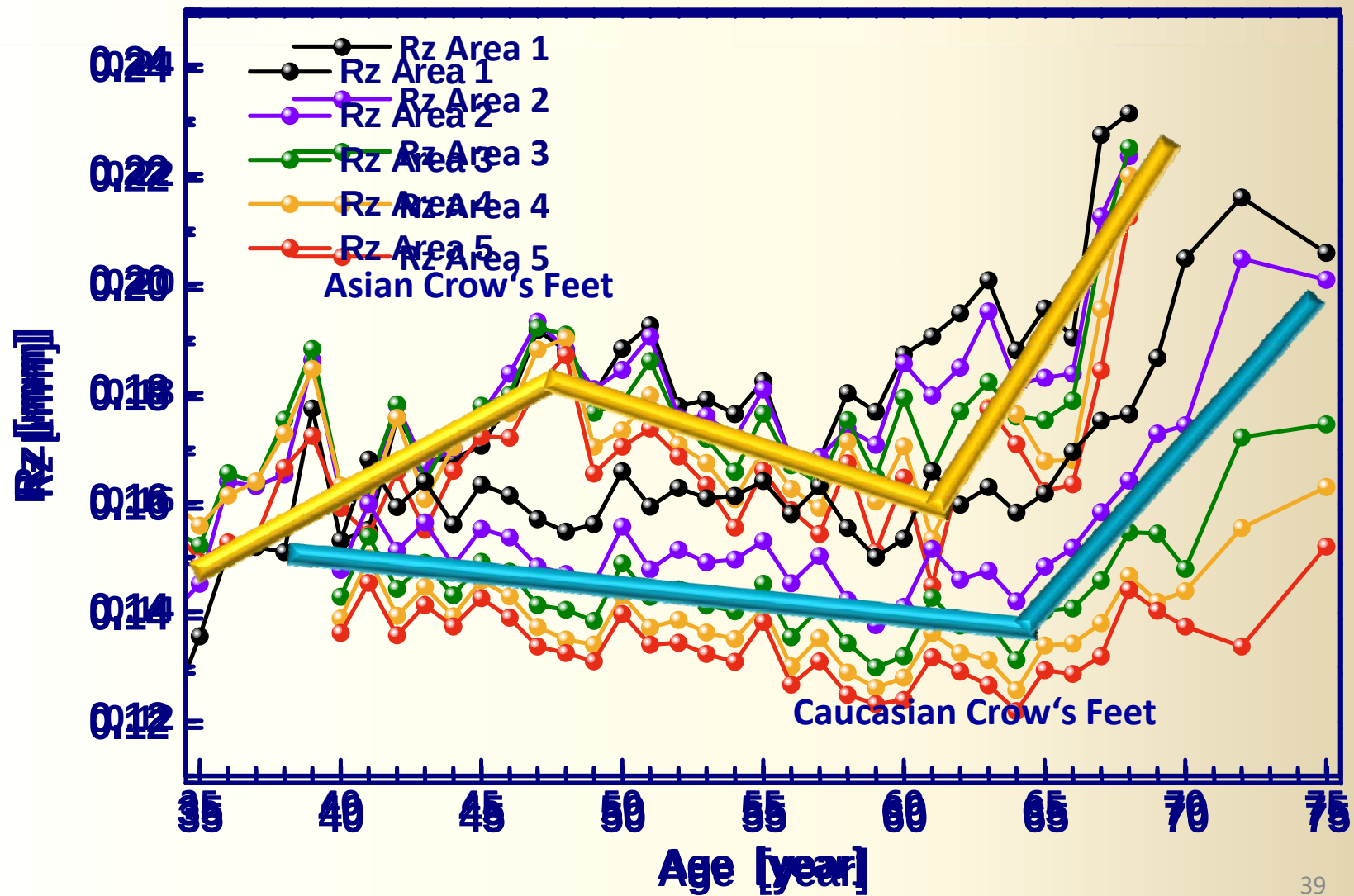
- Choose 550 Subjects (1100 Eyes)
- Baseline analysis of **Rz**
(after 45 min - climatized Lab)
- Statistical analysis as a function of **Age**
- Statistical analysis as a function of **Sub-Area**



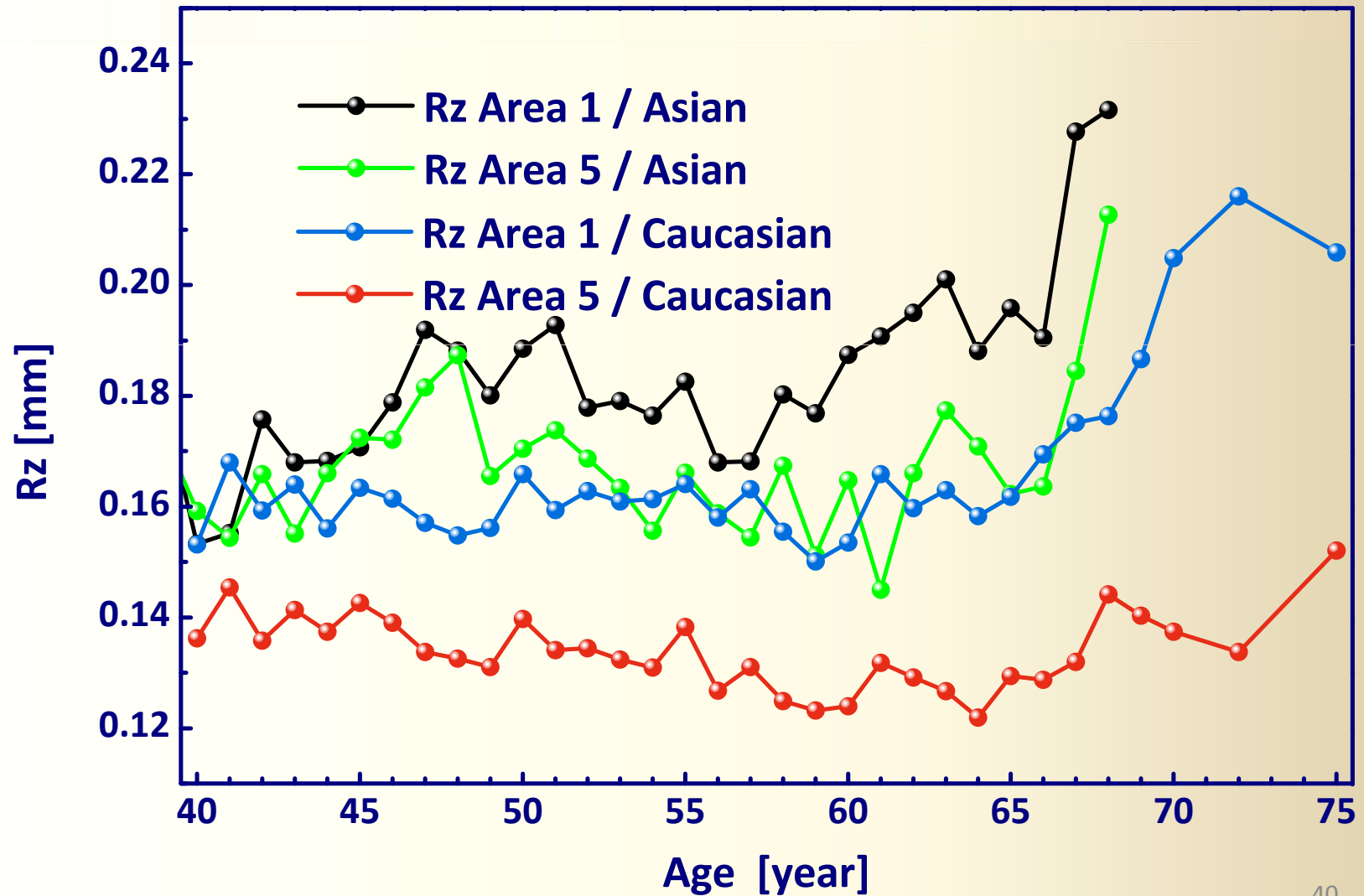
FOITS – Age / Rz mean value per age / n=550 Asian Skin



FOITS – Asian / Caucasian



FOITS – Asian / Caucasian

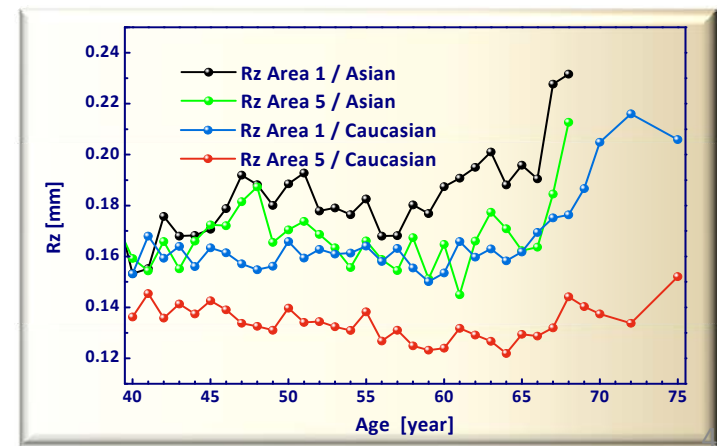


FOITS – Asian / Caucasian

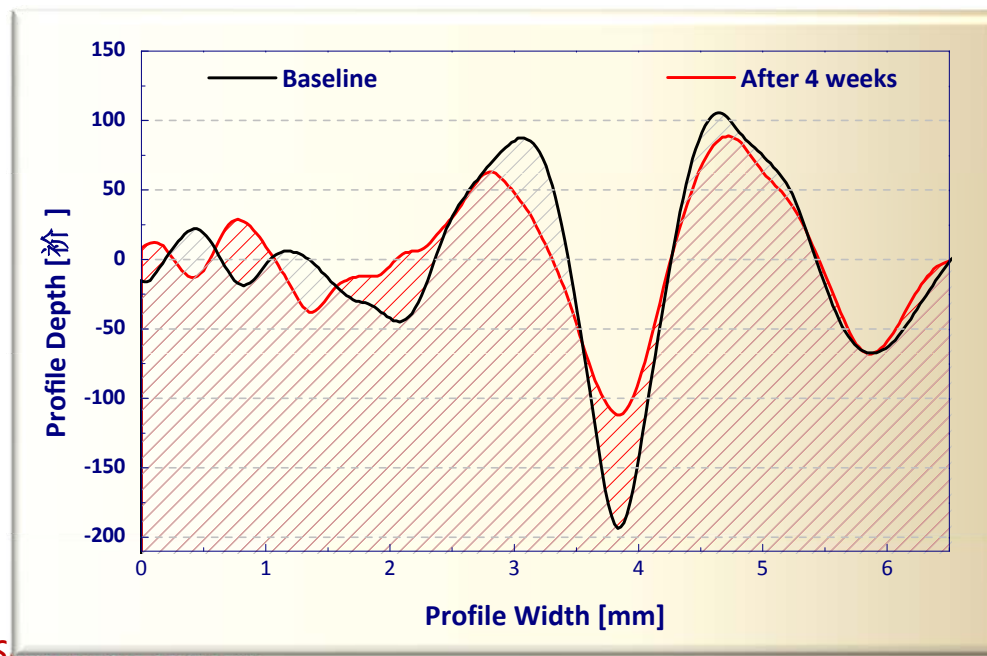
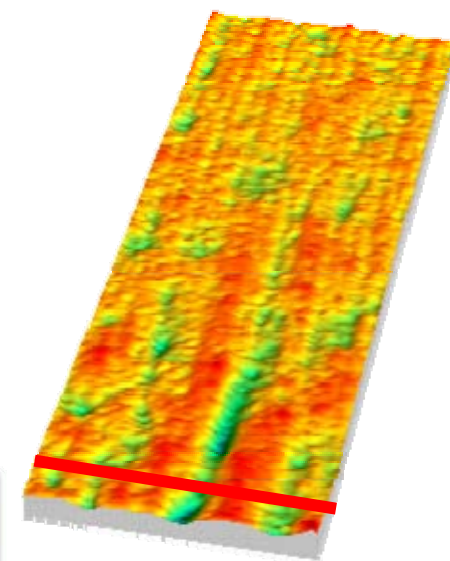
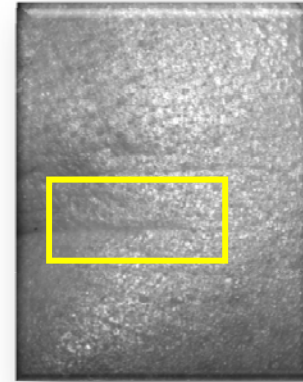
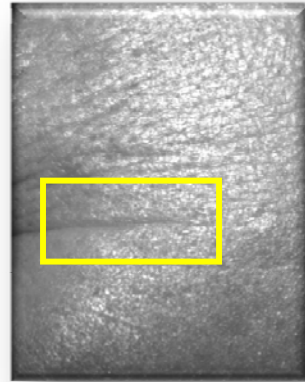
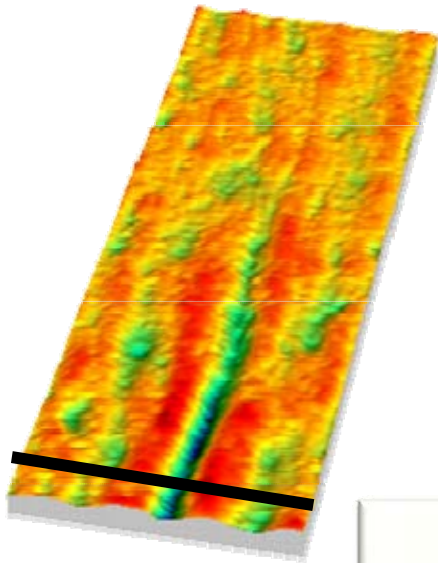


➤ Ethnic Differences?

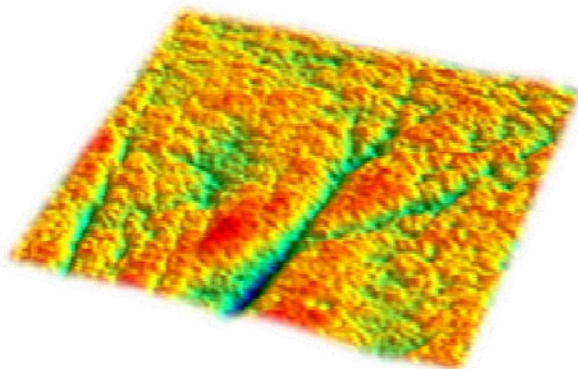
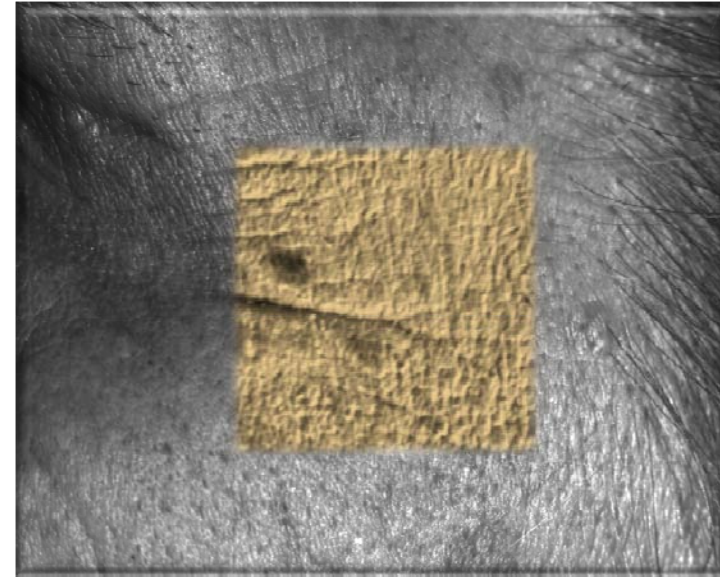
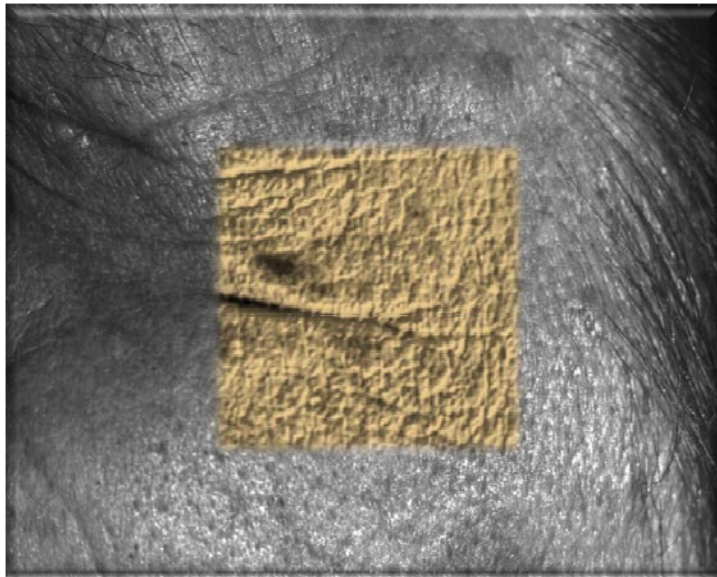
- ➡ Area1 and Area 5 are much closer on Asian Skin
no deep wrinkles on younger Skin
- ➡ Roughness / Fine Structures seems to be more
pronounced on Asian Skin
- ➡ If deeper Wrinkles appears they seems to increase
earlier on Asian Skin



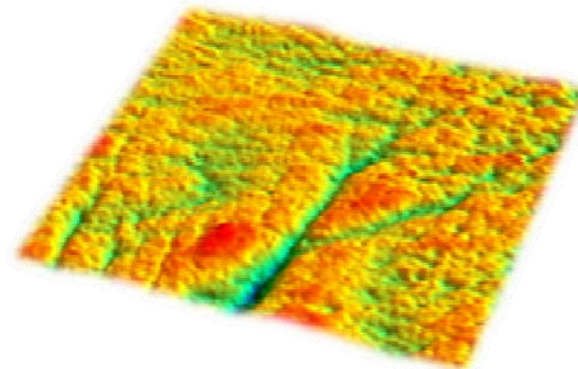
FOITS – Single Wrinkle



FOITS – 3D Presentation of Crow's Feet

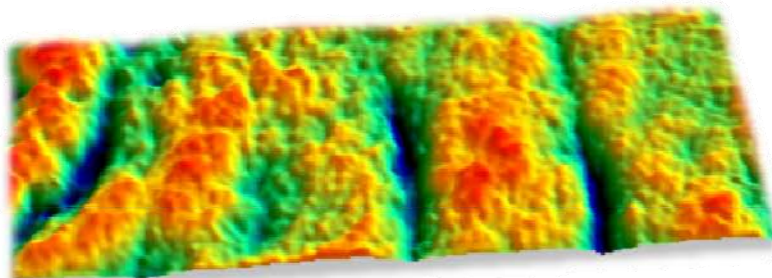


Baseline

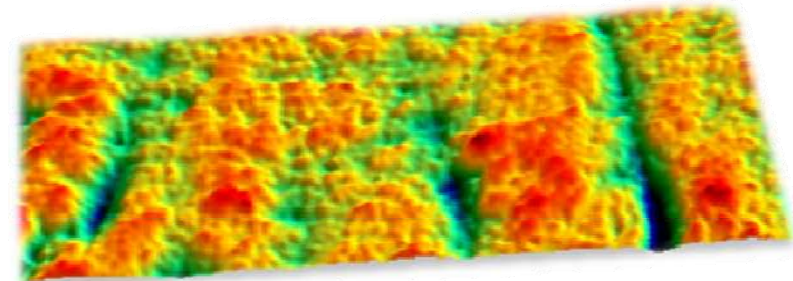


End value (4 weeks)

FOITS – 3D Presentation of Lips

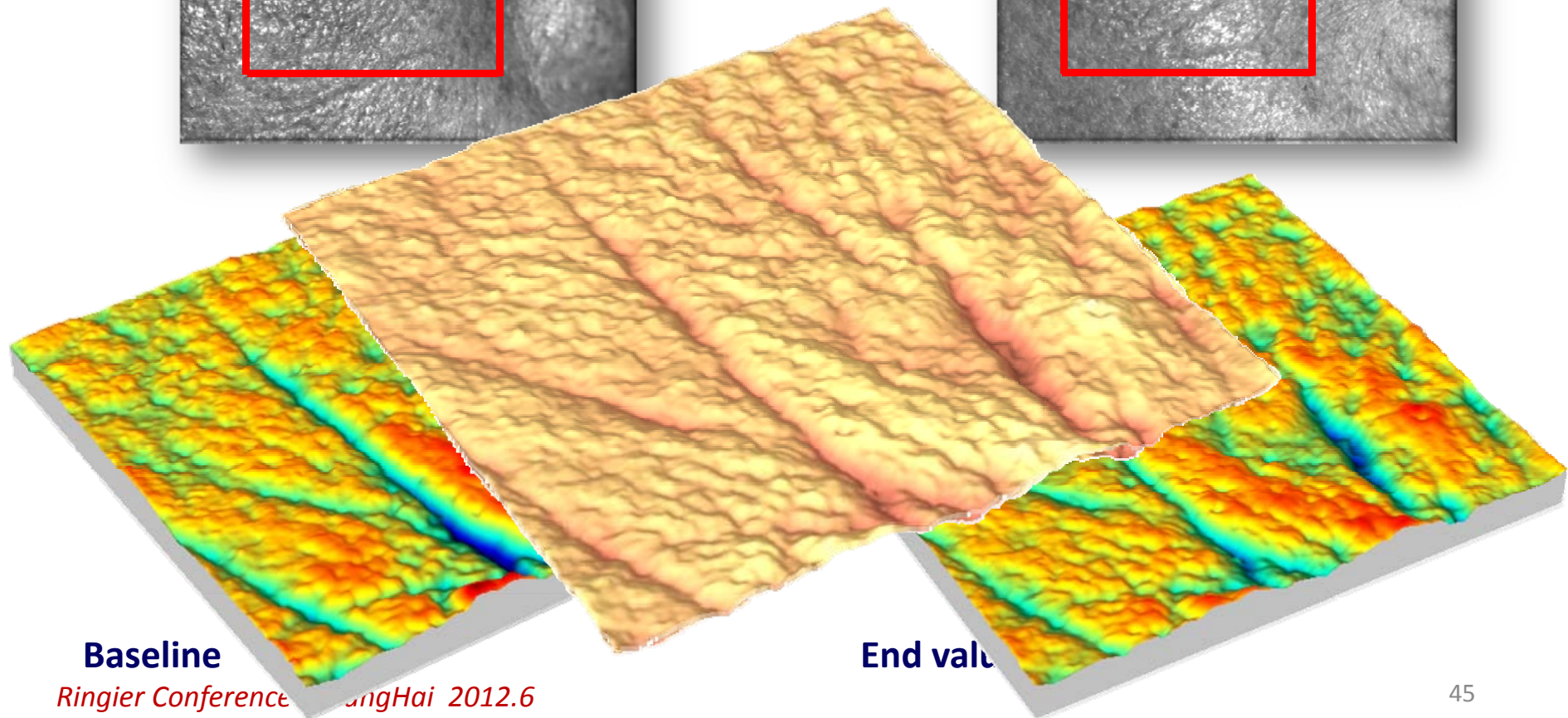
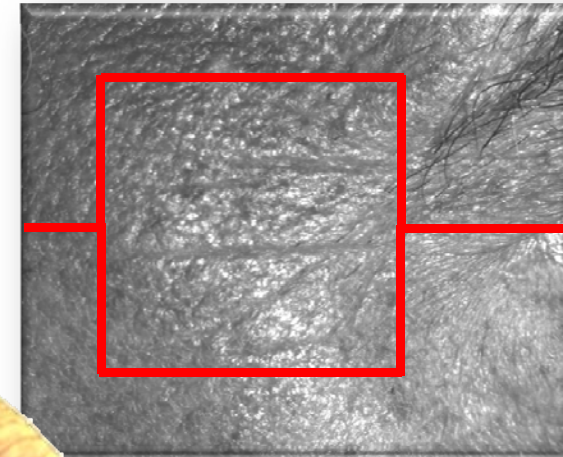
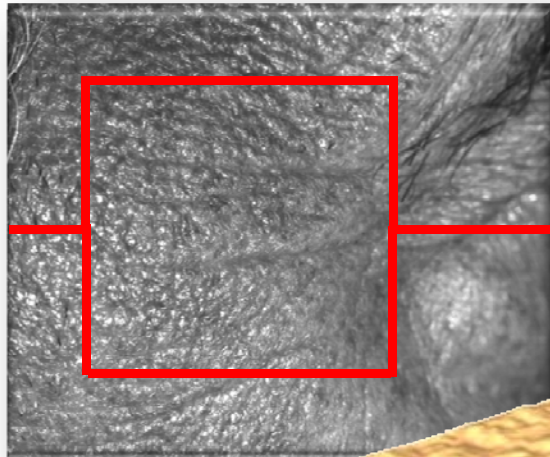


Baseline



End value

FOITS – 3D Presentation of Crow's Feet



Baseline
Ringier Conference Shanghai 2012.6

End value



谢谢
Thank you
for your kind attention

