

# **RUMBA**

## **Hair Orientation Imaging System**

Complete in-vivo characterization of visual appearance  
to  
Substantiate claims & Evaluate product efficacy  
*on every hair color*

**Bossa Nova**  
**Tech**

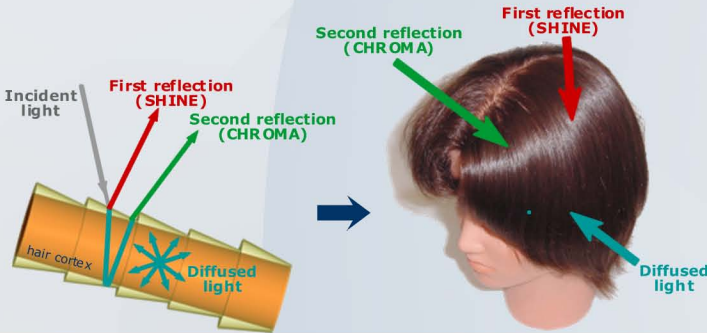
# INTERACTION OF LIGHT WITH HAIR

Light interacts with hair fibers in a way that 3 different types of light are observed.

- **First reflection (SHINE)** on the surface of the fibers. This reflection creates a **SHINE** band on hair.
- **Second reflection (CHROMA)** from the reflection of the transmitted light on the bottom surface of the fibers.

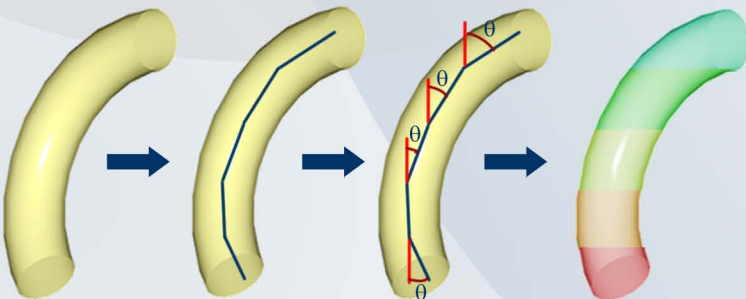
This reflection (also called **CHROMA** or internal reflection) creates a band carrying color information specific to the fiber. It plays an important part in the visual appearance of hair.

- **Diffused light** is a background uniform color on which reflections overlay. It comes from the internal scattering.



# TECHNOLOGY

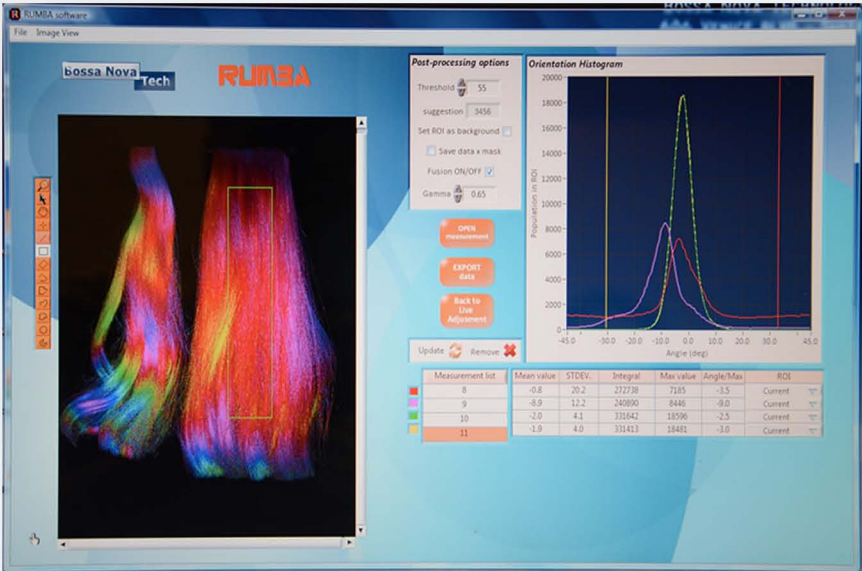
When hair fibers are illuminated by a light source, part of the incident light is reflected on the surface of the hair - specular component - and part is transmitted through to hair fiber and reflected on the back surface - chroma component - . Hair fibers present a natural birefringence, which orientation axis is aligned with the fiber axis. Using the chroma polarization signature, RUMBA measures the birefringence information and therefore the orientation of the hair fiber.



# SOFTWARE

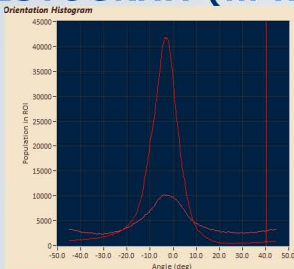
A user-friendly software allows the user to acquire the measurement in one click. A complete analysis (numerical data, histograms and color images) of the hair fiber orientation is delivered in seconds. Numerical data, angular profiles and images can be quickly compared and exported for reports, presentations or post processing.

## Main Window

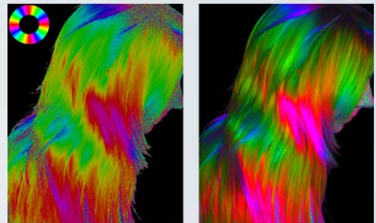


# OUTPUT DATA

## HISTOGRAM (in ROI)



## ORIENTATION IMAGES

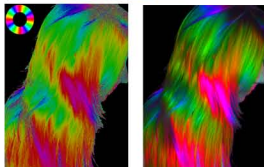


Fusion

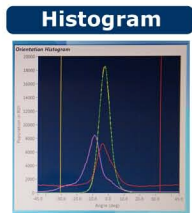
## DATA (in ROI)

- Mean angle
- Standard deviation
- Integral (pixels)
- Max value
- Angle of Max
- Area.

# RUMBA Hair Orientation Imaging System



Numerical Data					
Measurement No.	Color Code	Angle	Measurement	Angle/Hz	Hz
1	0.0	0.0	0.000	0.0	0.000
2	0.0	0.0	0.000	0.0	0.000
3	0.0	0.0	0.000	0.0	0.000
4	0.0	0.0	0.000	0.0	0.000
5	0.0	0.0	0.000	0.0	0.000
6	0.0	0.0	0.000	0.0	0.000
7	0.0	0.0	0.000	0.0	0.000
8	0.0	0.0	0.000	0.0	0.000
9	0.0	0.0	0.000	0.0	0.000
10	0.0	0.0	0.000	0.0	0.000
11	0.0	0.0	0.000	0.0	0.000
12	0.0	0.0	0.000	0.0	0.000
13	0.0	0.0	0.000	0.0	0.000
14	0.0	0.0	0.000	0.0	0.000
15	0.0	0.0	0.000	0.0	0.000
16	0.0	0.0	0.000	0.0	0.000
17	0.0	0.0	0.000	0.0	0.000
18	0.0	0.0	0.000	0.0	0.000
19	0.0	0.0	0.000	0.0	0.000
20	0.0	0.0	0.000	0.0	0.000



RUMBA is a unique tool to analyze the visual appearance of hair. It is now used in the cosmetic industry to **substantiate claims** and **evaluate products efficacy** such as shampoo, conditioners, antifrizz, etc. , on every type of hair.  
RUMBA comes as a turn-key system including hardware and computer with dedicated software.

## HAIR SAMPLE SPECIFICATIONS

Hair Type	Any color - Any shape
Hair Sample	Hair Tress - Mannequin head - Consumer head

## DATA

Data Format	Images (Monochrome Color images) Histograms Numerical data
Measurement uncertainty	1% over 24h
Data repeatability	<1%

## GENERAL SPECIFICATIONS

Image resolution	4M pixels
Illumination	Pulsed LEDS @850nm (eye-safe)
Spatial resolution	130 microns (stand-off = 23") Down to 80 microns (stand-off = 12")
Area of measurement	12" x 8" at 23" stand-off
Acquisition time	<1s, allowing in-vivo measurements
Computer	Slimline HP PC & 19" flat screen monitor Windows 7 Home Edition Excell 2010 licence
Weight/dimension	7"W x 10"H x 9"D - 10lbs 178mm W x 254mm H x 229mm D - 5 kg
Electrical requirements	110/220 V, 50/60 Hz



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