엘트라글로벌 회사소개서

LTRA GLOBAL Company Brief

Sep. 2019

LTRA
Laser Treatment & Application

Vision

LTRA
Laser Treatment & Application

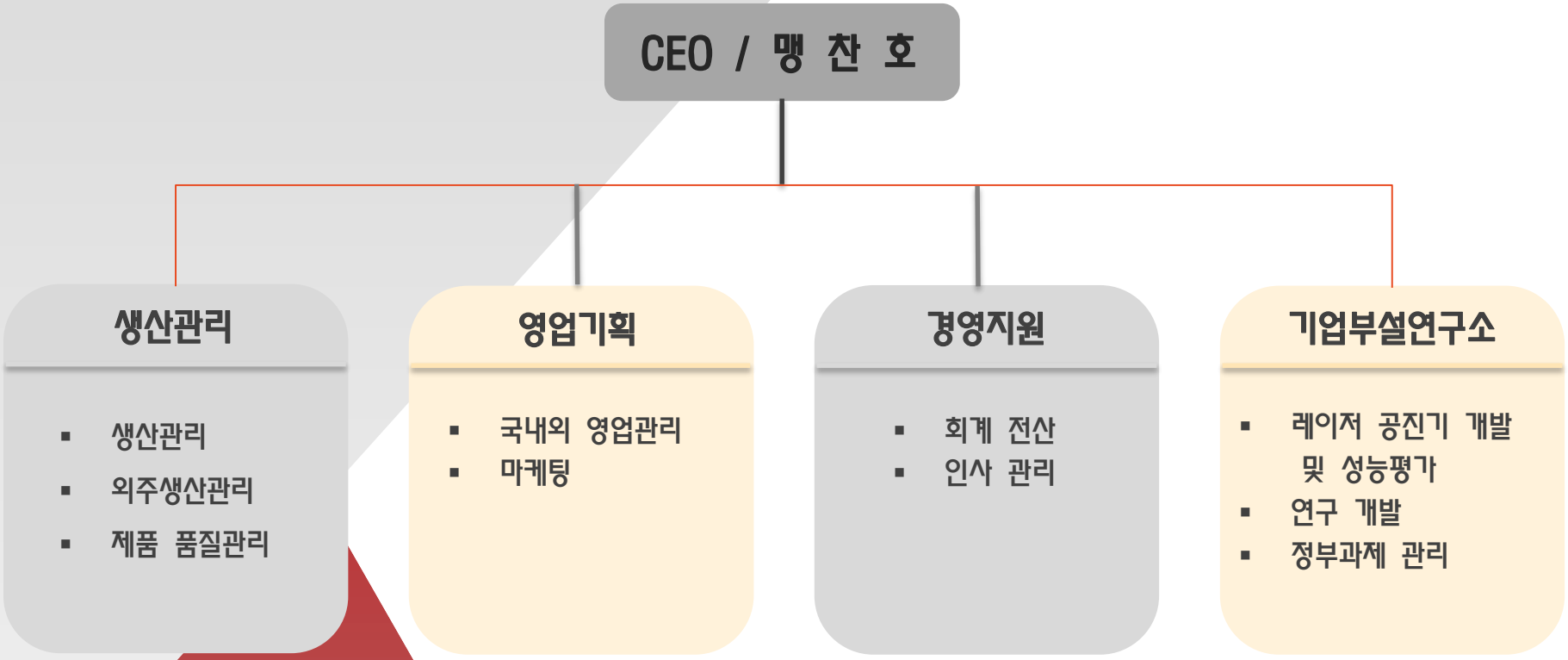
01 고객만족
Customer Satisfaction

02 팀워크
Teamwork

03 전문가
Professional

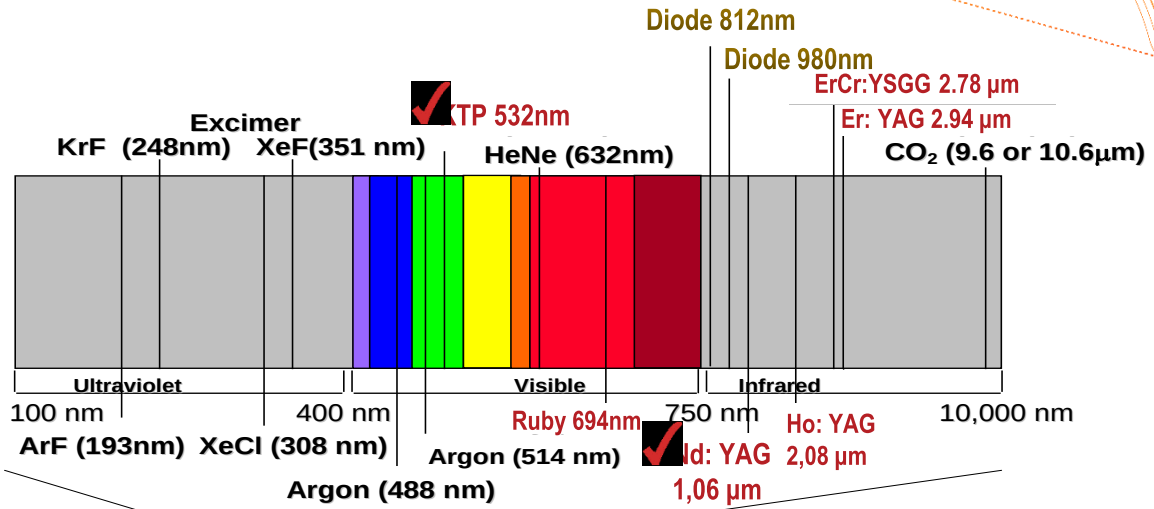
Miin laser

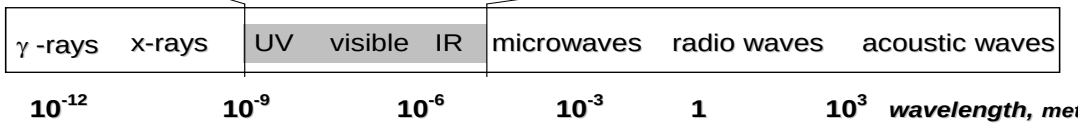
조직도 Organization

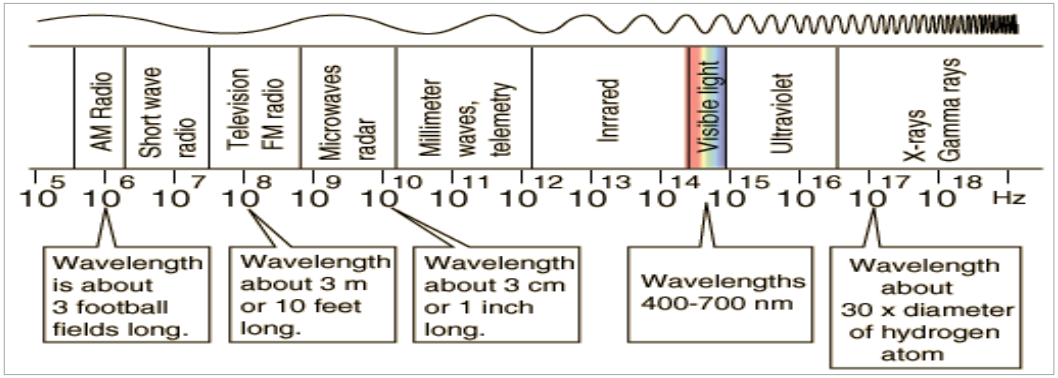


Technical Introduction

1-1. Laser Spectrum

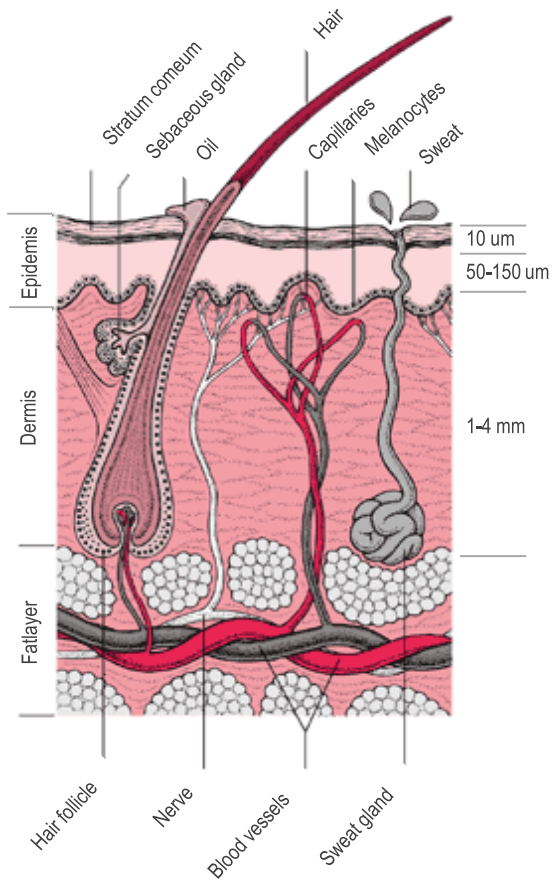






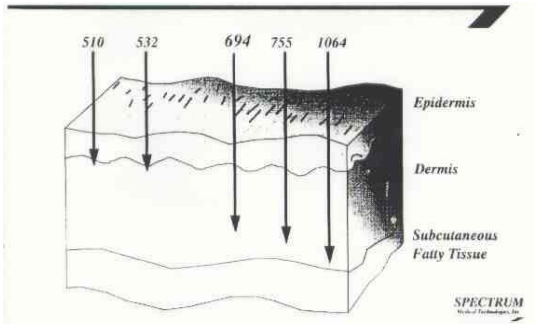
1-2. Effect of Laser Beam on Biological Tissue

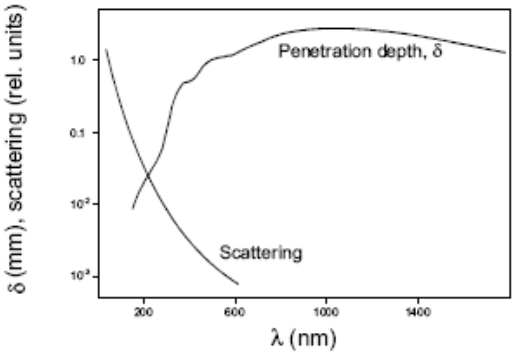
Interaction between laser and living tissue: Absorption (penetration depth)



The stain is produced by the melanocytes (the pigment-producing cells of the skin) and the melanocytes absorb or disperse the laser light

Wavelength Determines Depth of Penetration



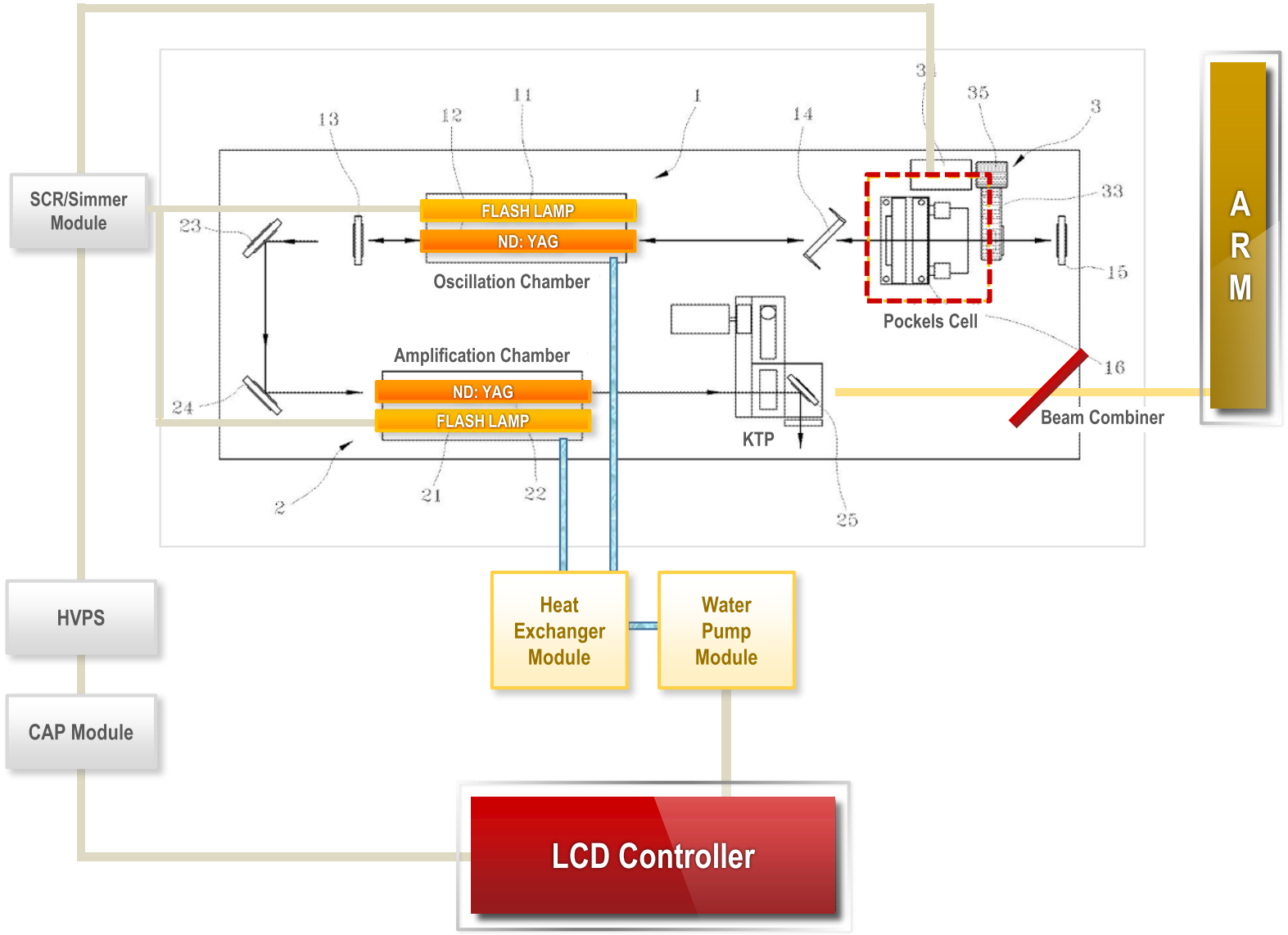


Light penetration depth to skin tissue

Specification

Laser Type	Q-switched Nd:YAG laser	
Wavelength	1064/532nm	
Pulse Duration(nm)	1064 Single	<10ns
	532 Single	<10ns
	Quasi	<350us
	1064 Double	<20ns
	MIIN (Multi Pulse)	100~200ns
Pulse Energy (Max.)	1064 Single	1.4J
	532	0.5J
	Quasi	3.5J
	1064 Double	2.5J
	MIIN	3.0J
Repetition Rate	Single, 1~10Hz	
Beam Delivery System	Articulated arm with handpiece	
Aiming Beam	Laser diode, 633nm/3mW	
Cooling System	Internal water to air heat exchanger	
Electrical Power	240VAC, 60Hz	
Dimension(nm)	320(W) x 820(L) x 880(H)	
Weight(kg)	75kg	

Two Chamber Laser Head



Laser Resonator

One Chamber

Max. E – 1.8J (Double Pulse)

Durability: 7M

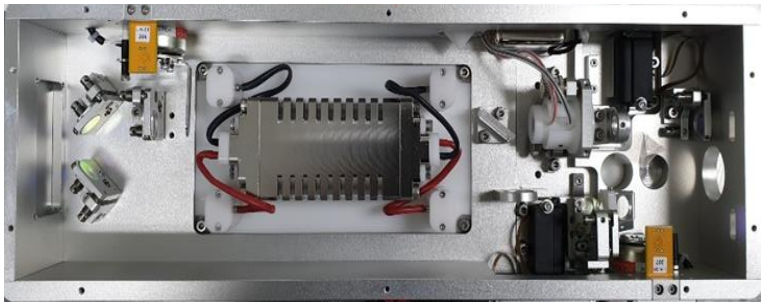
KTP: Unstable

Two Chambers

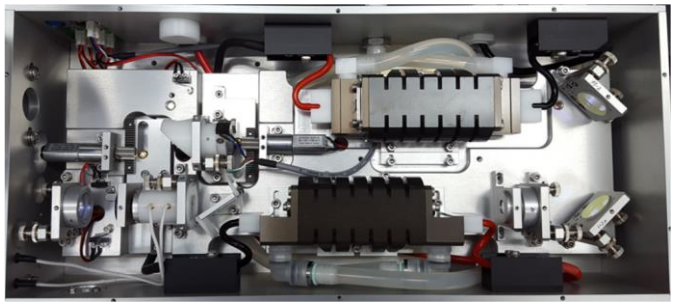
Max. E - 2.5J (Double Pulse)

Durability: 10M

KTP: Stable



<One Chamber Laser Head>



<Two Chambers Laser Head>

Mode

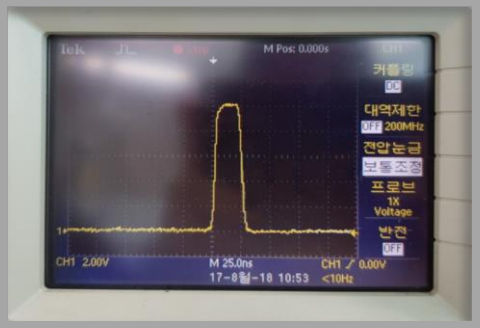
1064S — 1064nm single pulse laser mode by 10 nanosecond

1064D — 1064nm double pulse laser mode by 100~150us interval

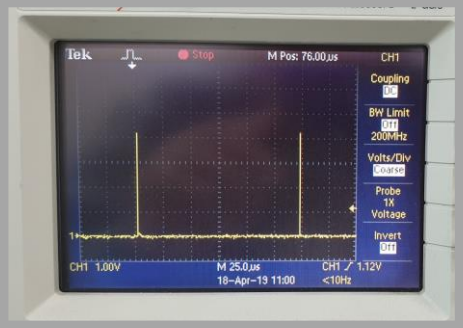
Quasi — Quasi long pulse laser mode by 350 microsecond

532 — 532nm single pulse laser mode by 10 nanosecond

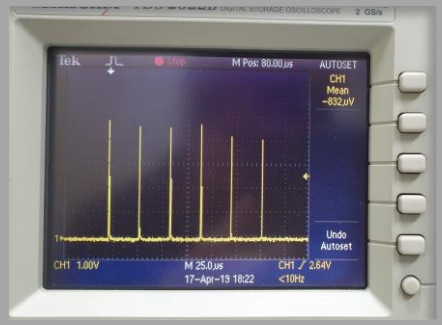
Miin — 1064nm multi pulse laser mode by 25us interval



1064 Single



1064 Double



MiiN Mode

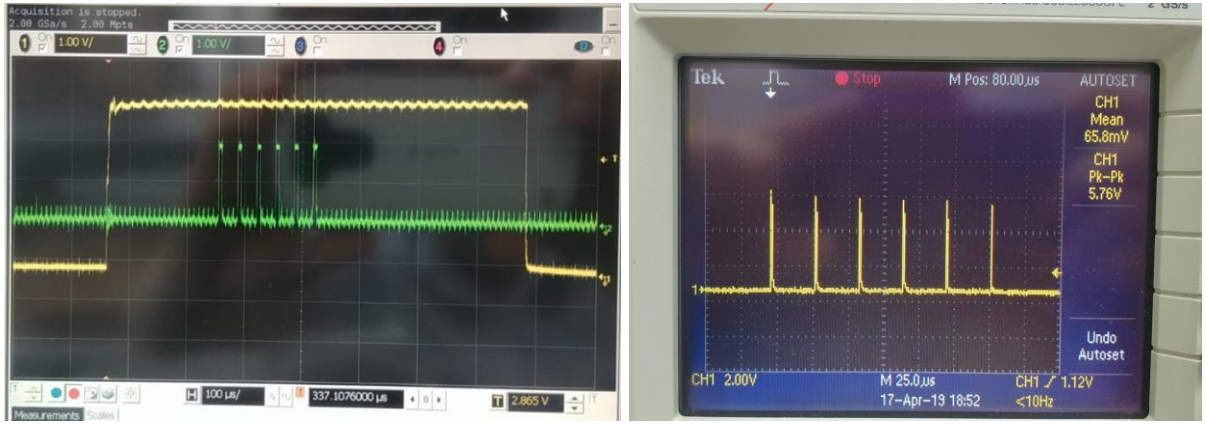
New Function – MiiN Mode

Specialized to treat Melasma

MIIN Mode – 4 ~ 8 Multi Pulsed Mode

Maximum Energy – 3J (ex. 500mJ * 6 pulses)

It is treated as high energy as 3J,
but it is split into multi pulse with Nano Second.
A specialized Melasma treatment program to reduce side effects.

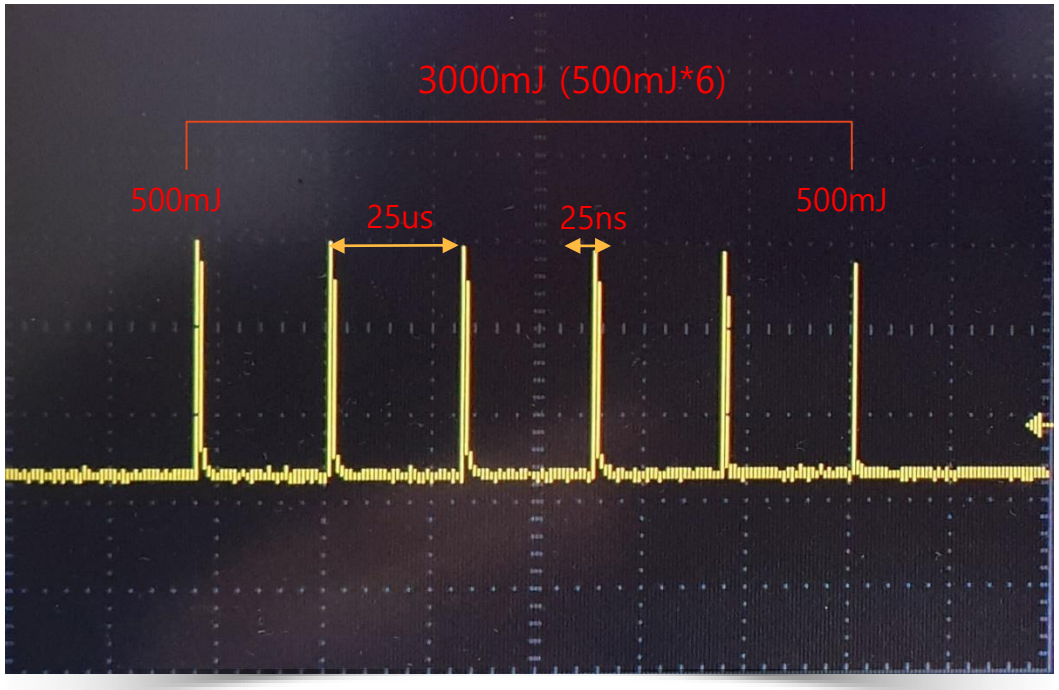


Captured by Photodiode

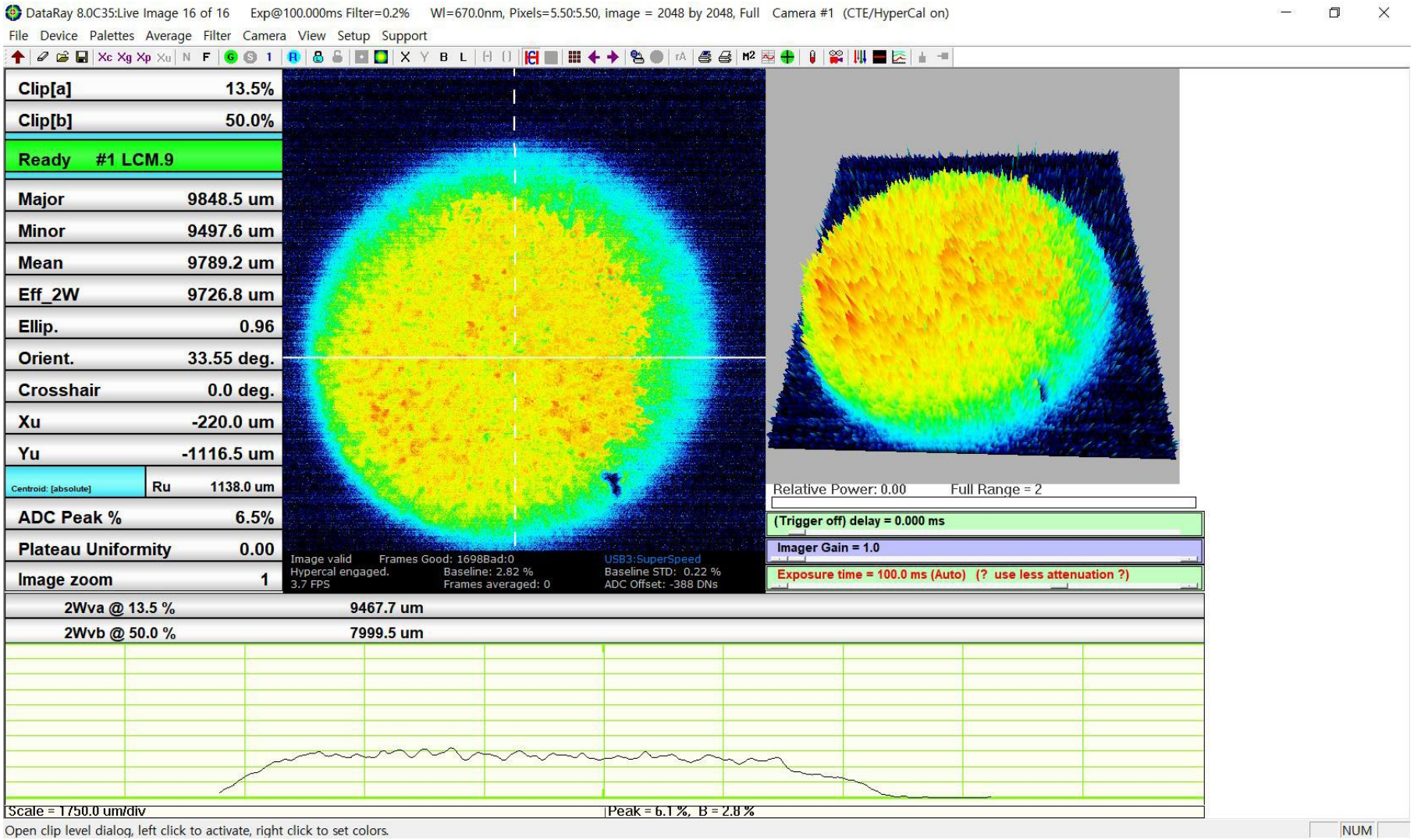
Laser Power (MIIN LASER)

Laser Parameters :

Q Switch Laser (J):	3	(MIIN Mode)
Pulse Duration (ns)	25	
Power (J/sec)	120MW	6 pulses
Power (J/sec)	20MW	1 pulse
Zoom 10mm (W/㎠)	25.4MW	1 pulse
Zoom 5mm (W/㎠)	105.2MW	1 pulse



Beam Profile at 1000mJ



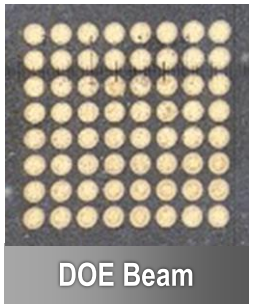
MLA Handpiece

Apply the same MLA handpiece **used in pico second laser to treat Pores and Acne scars.**

MLA Beam

(Micro Lens Array)
Ø 10mm
100 ~ 110spots

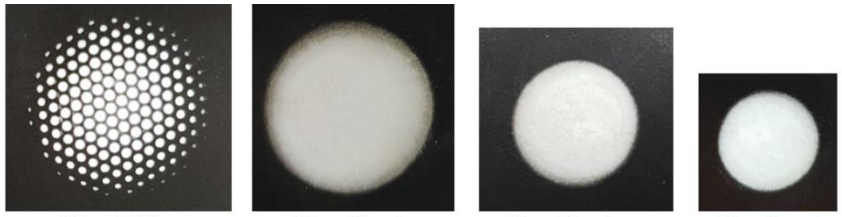
VS



DOE Beam

(Diffraction Optical Elements)
5mm * 5mm
64 spots

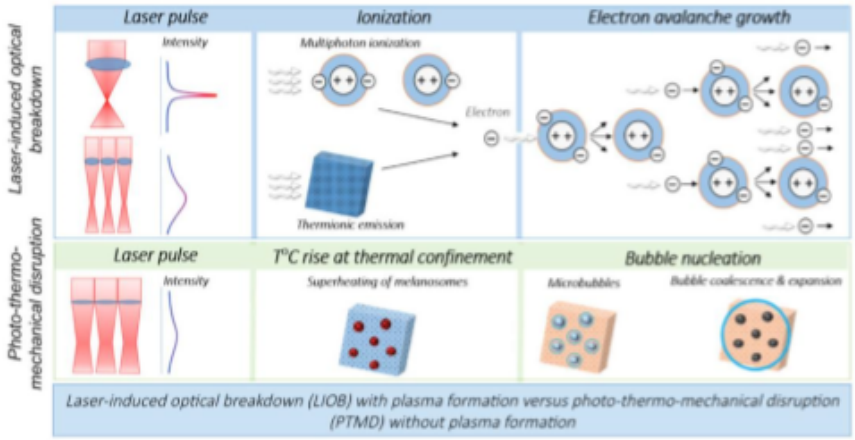
1064 Single Beam patterns



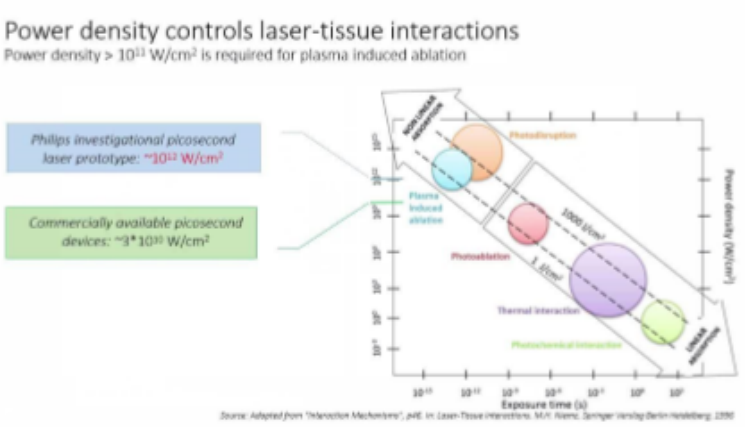
(10mm MLA) (10mm Zoom) (8mm Zoom) (5mm Zoom)

Laser Induced Plasma (MIIN LASER – MLA Handpiece)

- It is well known that for sufficiently high electric field strengths in an insulating medium (e.g. air or glass) a *breakdown* can occur.
- This means that there is a kind of spark, and the medium becomes electrically conducting. The mechanism behind this effect is based on the acceleration of free electrons to high energies so that collisions with other atoms or molecules can lead to secondary free carriers.
- This starts an avalanche process, during which appreciable densities of free carriers can be built up within a short time. A plasma is formed, which can have a significant electrical conductivity. The plasma can be maintained by further current flow, which generates additional free carriers.

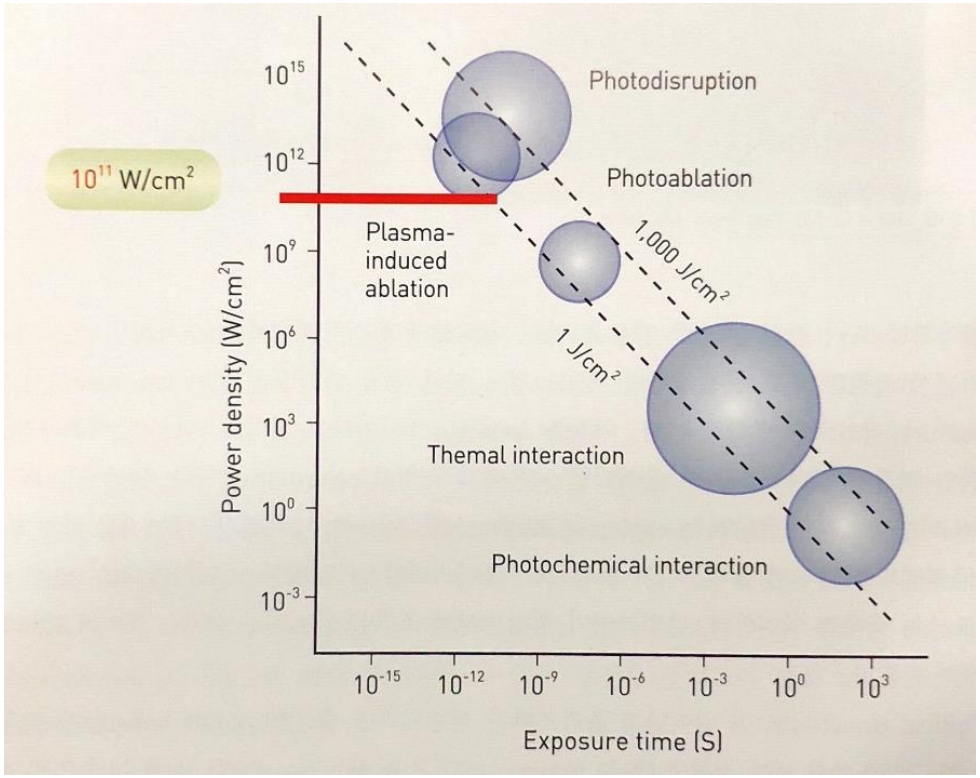


Laser-induced optical breakdown (LIOB) with plasma formation versus photo-thermo-mechanical disruption (PTMD) without plasma formation



- The physical mechanism behind such high power density (picosecond) laser was *attributed* to **laser-induced optical breakdown.**
- The when **irradiance threshold exceeds 10^{11}W/cm2**, **plasma-induced ablation** occurs.

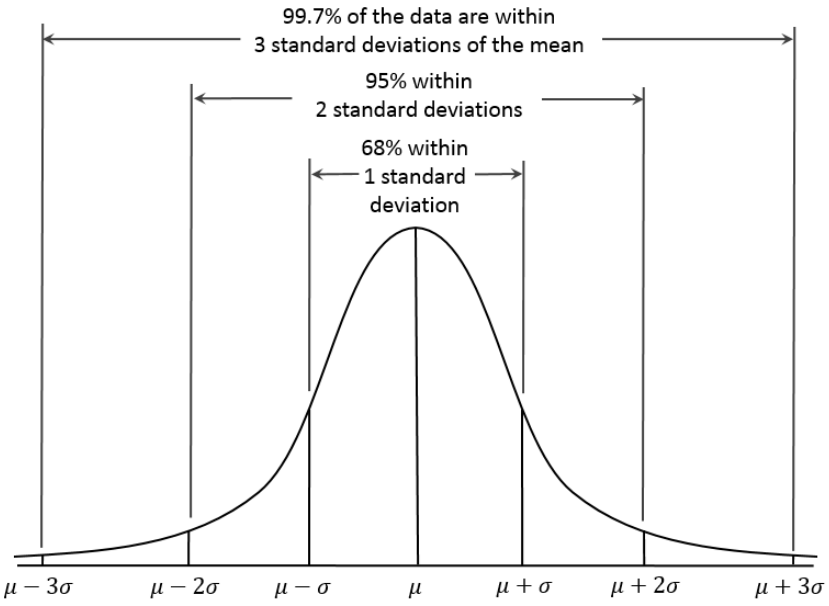
Laser Induced Plasma (MIIN LASER – MLA Handpiece)



Laser parameters:

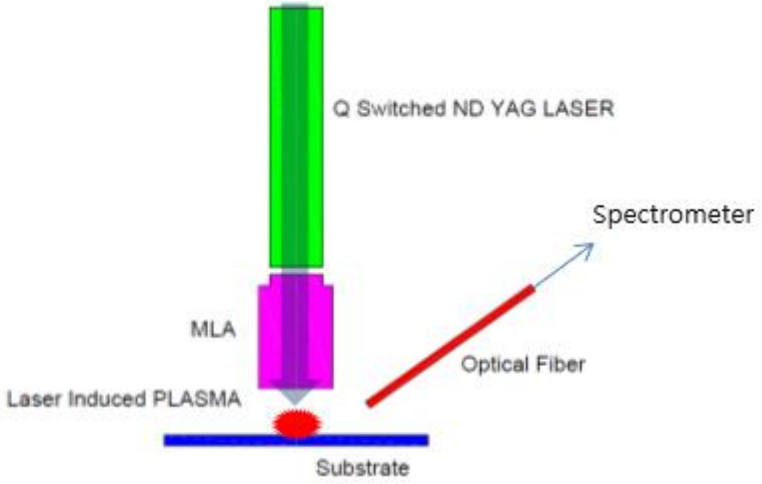
Q Switch Laser (J):	1.4	
Pulse Duration (ns)	10	
Cross-sectional Area (㎠):	ϕ 1㎝	0.785㎠
Cross-sectional Area (㎠):	ϕ 0.3㎝	0.07065㎠
MLA for each spot:	ϕ 0.025㎝	0.0004906㎠
Q Switch Laser (J):	0.952	with 1σ

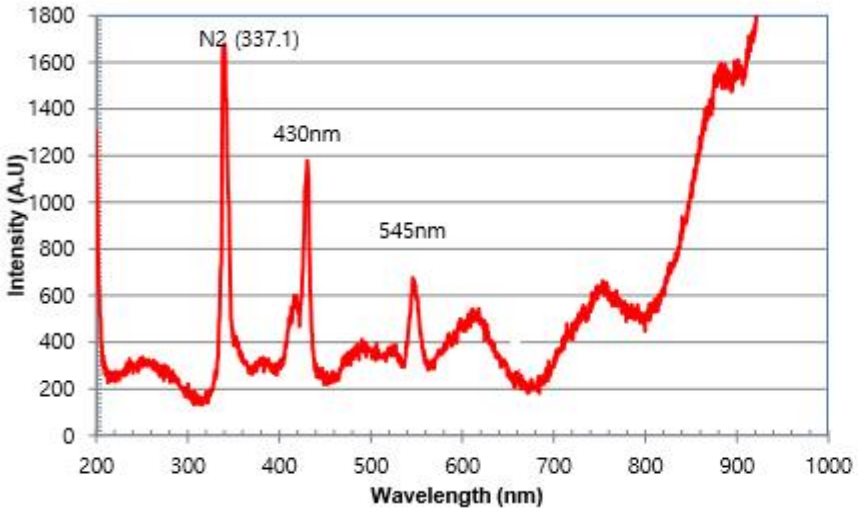
Energy (J)	Power (J/sec)	J/㎠	J/㎠ (1σ)	J/㎠-sec (1σ)	**J/㎠-sec (MLA: 0.025㎝)**
1.40E+00	1.4E+08	1.78E+00	1.35E+01	1.35E+09	**2.75E+11**



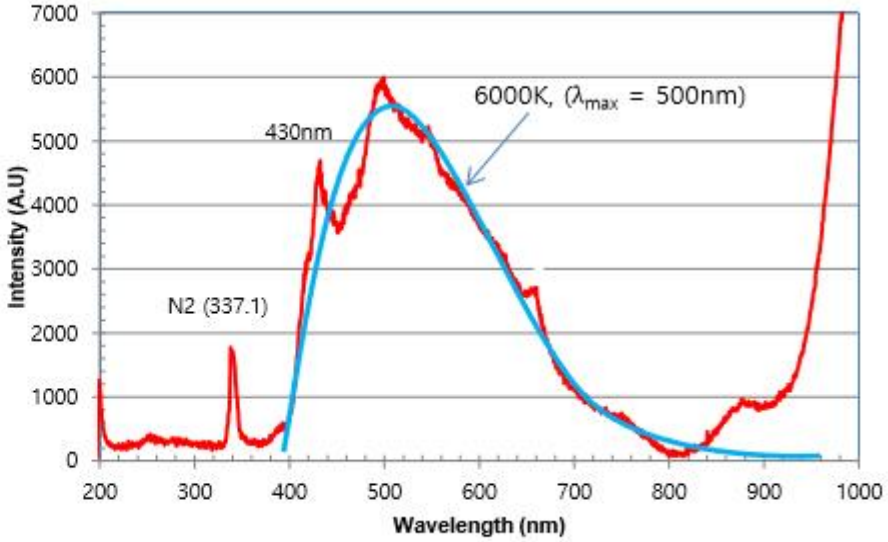
For the normal distribution, the values less than one standard deviation away from the mean account for 68.27% of the set; while two standard deviations from the mean account for 95.45%; and three standard deviations account for 99.73%.

Laser Induced Plasma (MIIN LASER – MLA Handpiece)





LASER Induced Plasma: Acetyls Substrate



LASER Induced Plasma: Paper Substrate

Laser Induced Plasma (MIIN LASER – MLA Handpiece)

Comparison Active and Passive Q-switching

Simply comparing passive and active q-switches,

Passive is like a dam without a gate, and active is like a dam with a gate.

If there is more than the allowable amount of water in a dam without a gate, the water level will be overflowed.
But if there is a gate in the dam, the water level can be adjusted.
The active q-switch can easily adjust the pulse width and energy amount as necessary.

Passive	vs.	Active
Hard to control	**Pulse duration**	Easy to Control
Low	**Damage threthold**	High
<2,200mJ	**Max. Energy**	3,000mJ ~ 3,500mJ
Unstable (Depends on voltage)	**Multi-pulse**	Stable
>70%	**Non-q (%)**	<1%
high	**Thermal effect**	low

Comparison Table

Specification

Company	A 社	B 社	B 社	LTRA GLOBAL	Remarks
Model	H	S	V	MIIN	
Wavelength	1064/532nm	1064/532nm	1064/532nm	1064/532nm	
Max. Energy	Single – 1.3J	Single – 1.5J	Single – 1.2J	Single – 1.4J	Highest double pulse Energy
	RTP – 2J	PTP – 1.9J	PTP – 1.8J	Double – 2.5J	
Multi Pulse	No	No	No	YES	Melasma Treatment
MLA	No but DOE	No but DYE	No	Yes (Doe and Dye are optional)	Acne Scar Treatment
Pulse duration	5~10ns	5~10ns	5~10ns	10 ~ 25ns	
Power	220V	220V	220V	110 ~ 240V	Free Voltage

Clinical Data

(Before & After)

Pigment

Mode – MIIN (Multi-Pulse)

Energy – 1400mJ

Frequency – 5Hz

Spot Size – 5mm

Freckles

Freckles

Mode – 532nm

Energy – 20mJ

Frequency – 1Hz

Spot Size – 3mm

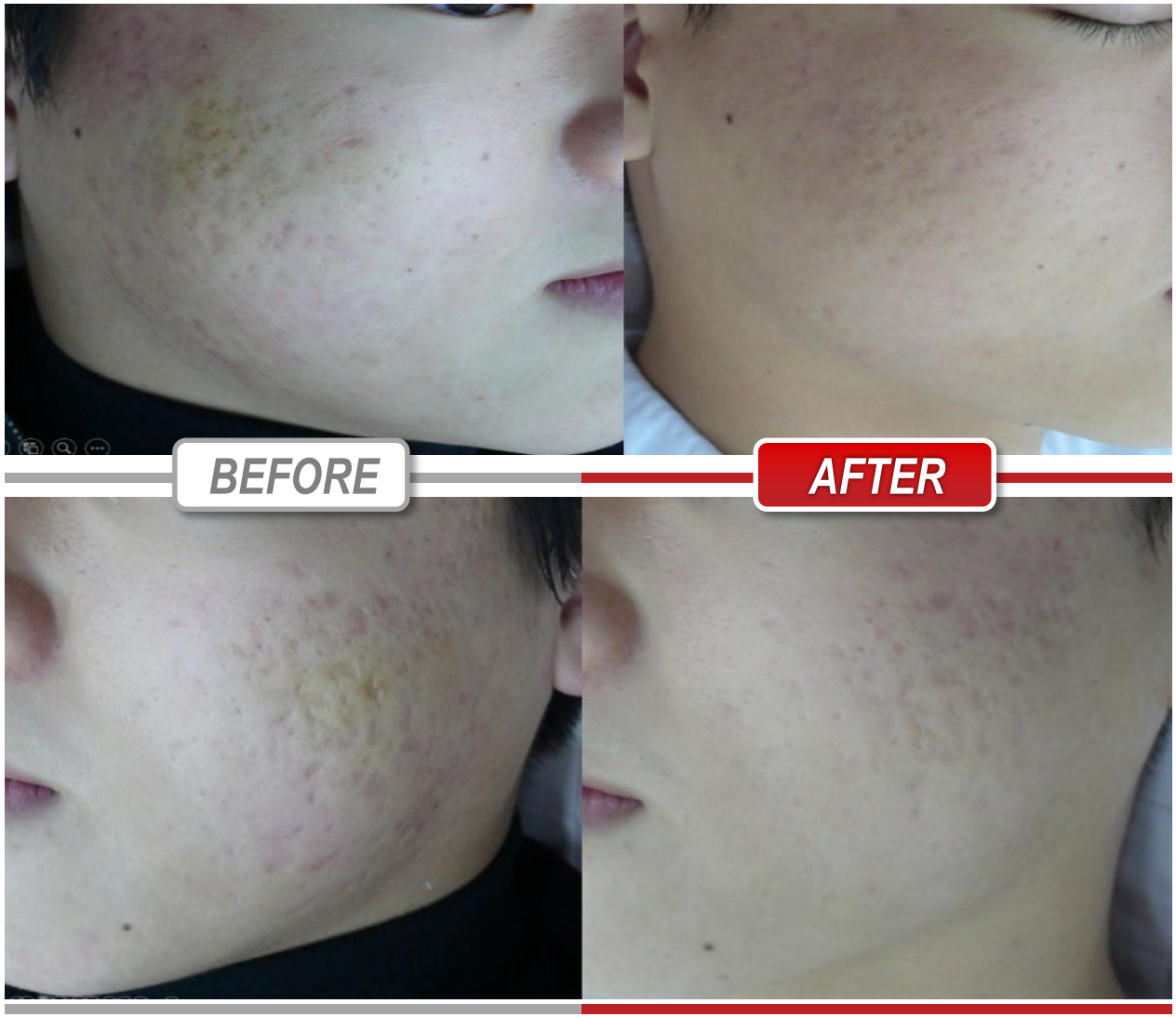
Acne Scar

Mode – 1064 S

Energy – 900mJ

Frequency – 3Hz Stacking

Spot Size – MLA



2times at 2weeks interval

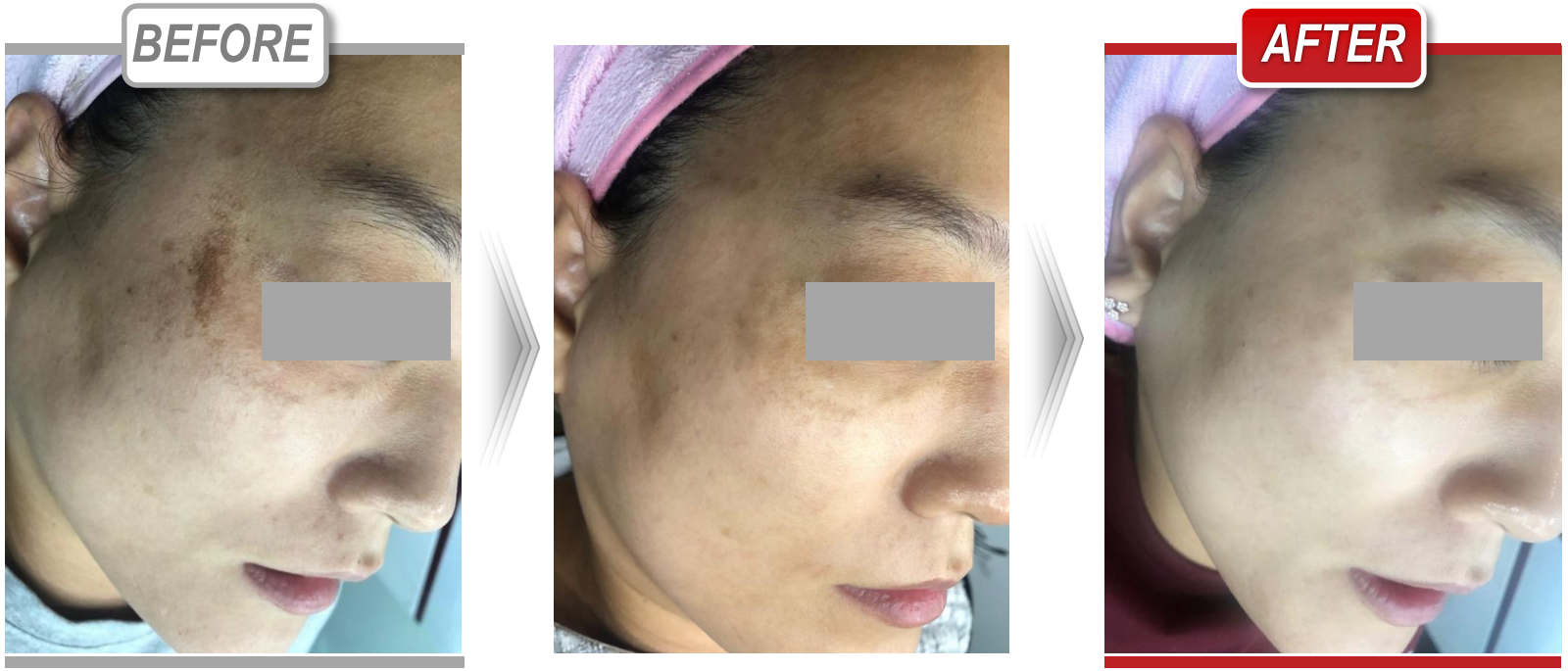
PIH

Mode – MIIN

Energy – 1500mJ

Frequency – 10Hz

Spot Size – 5mm



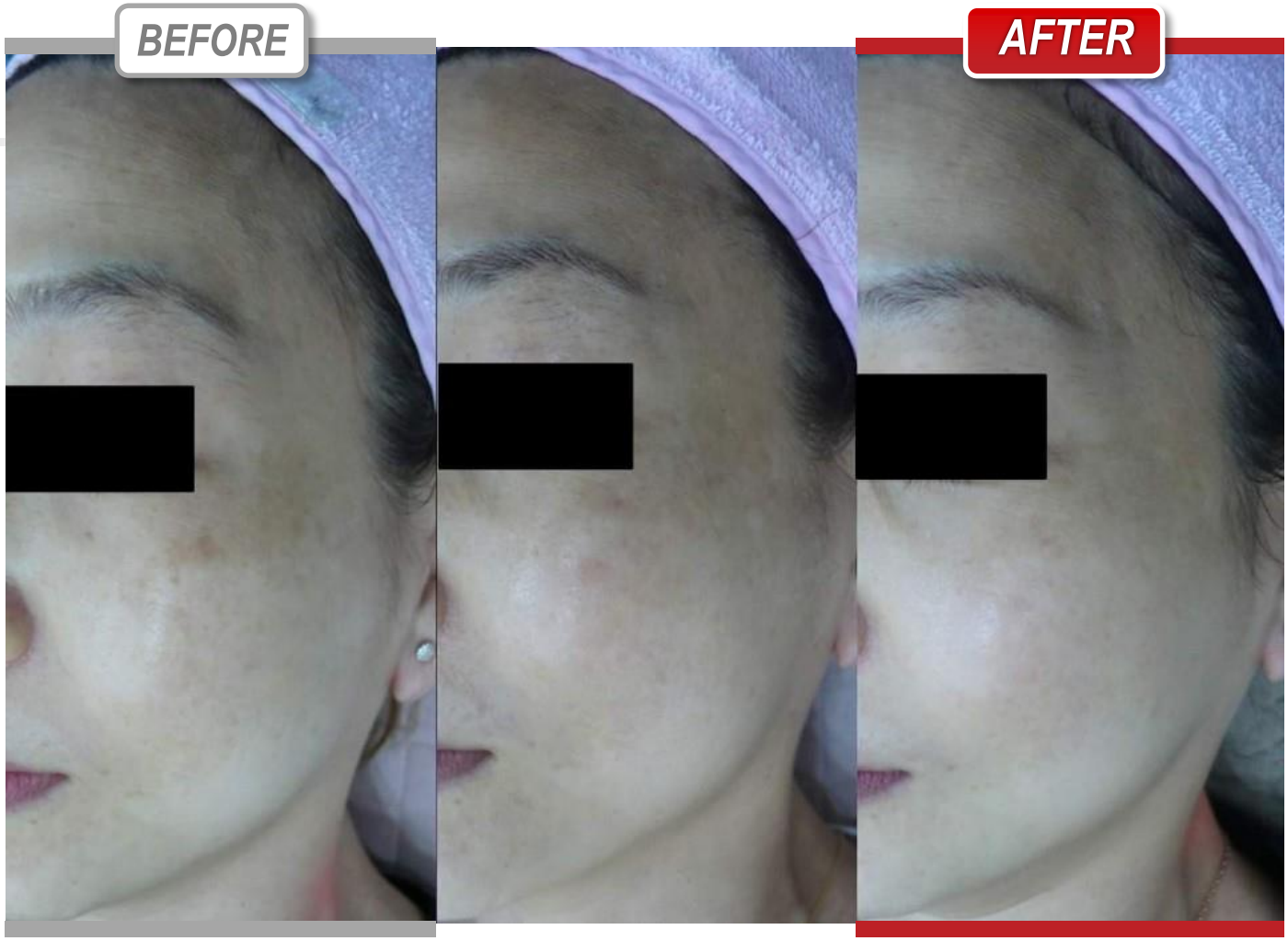
Melasma

Mode – MIIN

Energy – 2400mJ

Frequency – 1Hz

Spot Size – 4mm



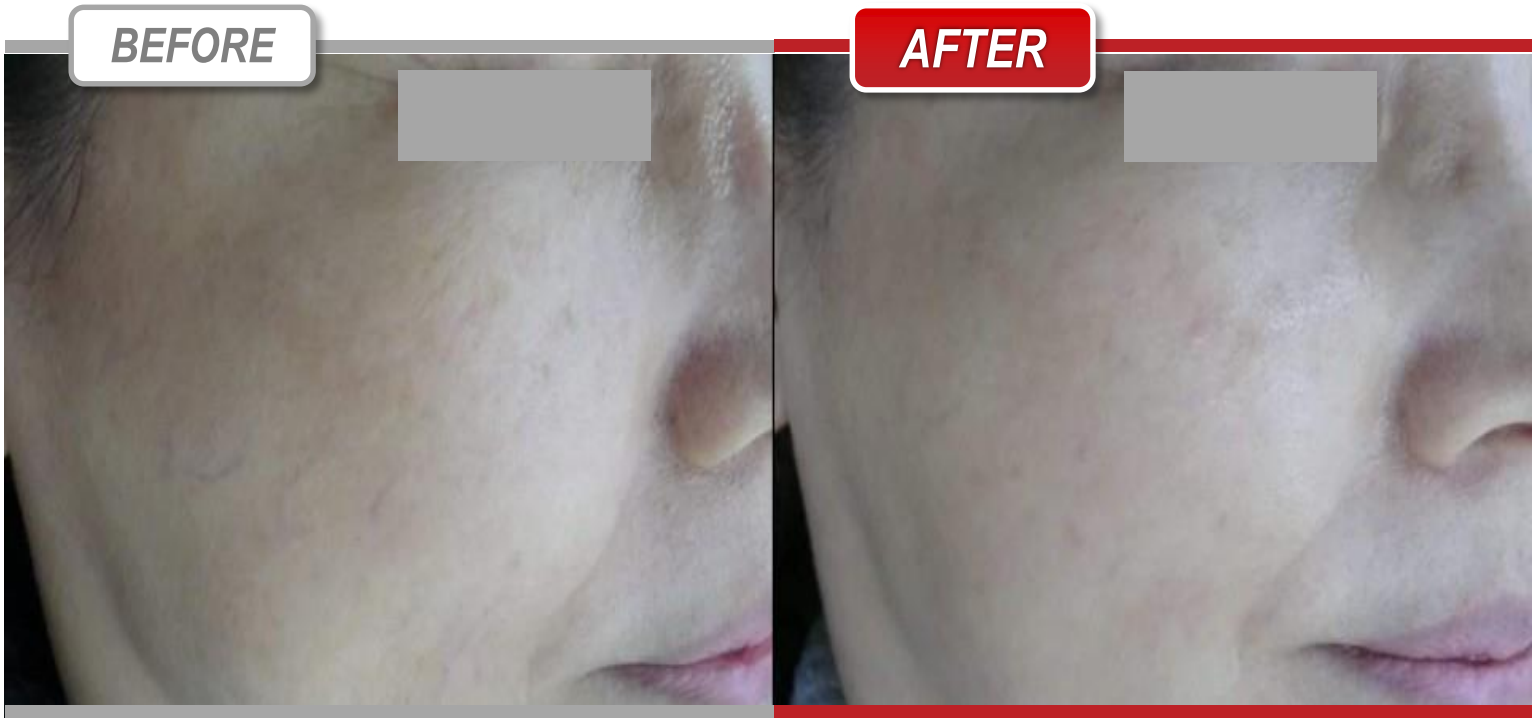
Vascular Vain

Mode – Quasi

Energy – 3000mJ

Frequency – 2Hz

Spot Size – 5mm



Freckles

OTA

Mode – 1064 S

Energy – 800mJ

Frequency – 2Hz

Spot Size – 6mm