声光可变焦透镜

上海昊量光电设备有限公司推出的可变焦透镜利用声音改变光的性质，使其可以实现连续快速变焦，分辨率可达到亚微秒。突破了传统变焦透镜速度和可靠性的瓶颈。即使在最严苛的光学系统中也可以表现出优异的性能。

该变焦透镜利用动态密度梯度创建一个低相差并且接近于衍射极限性能的非球面透镜。该变焦透镜采用声光的方式控制，这种新颖的作用机制不涉及任何移动部件，可以达到无与伦比的速度，频率可达到兆赫兹。这种机制使其在对景深的控制达到新的高度。为紧凑中的实时 3D 成像或扩展景深打开了大门。

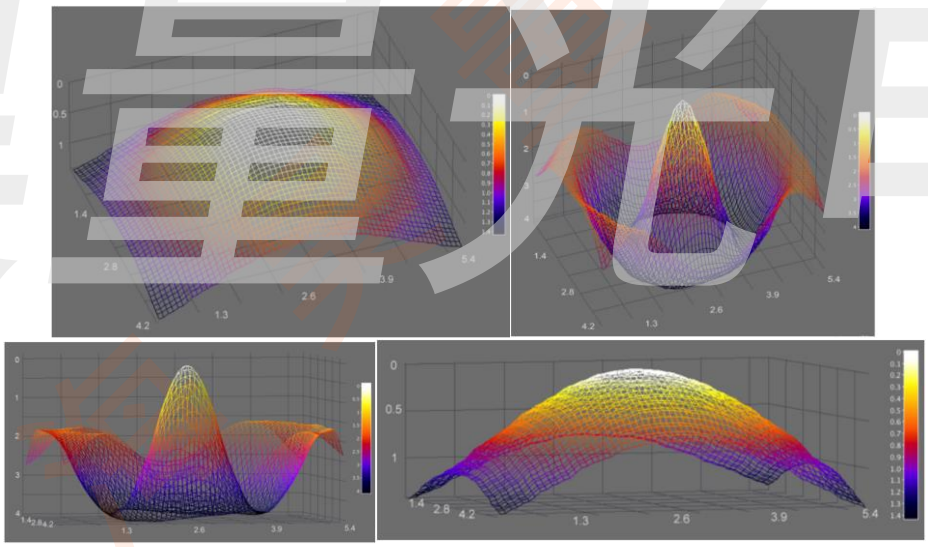


图 2. 可变焦透镜样品的波阵面

该透镜可以很轻松的集成到任何机器视觉、显微镜或激光加工光学系统中。他们的应用从传送带系统到安全成像，从多光子到白光显微镜，从激光切割到激光打标等系统应用。

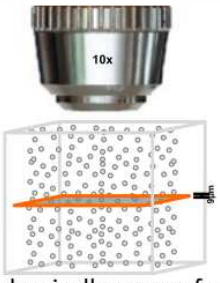
应用示例：

Sample Application: Detecting and Counting Beads in a Volume

Imaging System

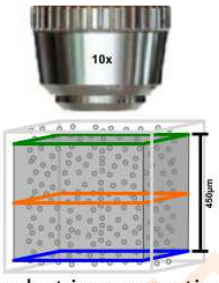
- Microscope: **Olympus BX60**
- Objective: **10x/0.25NA**
- Native DOF: **9 µm**
- Illumination: **Transmission**
- Sample: **Glass Beads in Water**
- Planes of Interest: **40**
- Sample Total Height: **400 µm**

TRADITIONAL SYSTEM



- Mechanically sweep focal plane across entire sample
- Total of 40 steps to image entire volume
- Sfw required to count beads in each image plane
- Time required: 10s sec.

ENABLED SYSTEM



- One shot images entire sample creating instantaneous z-projection
- No moving parts
- Sfw used to count beads of z-projection
- Time required: 1 camera frame

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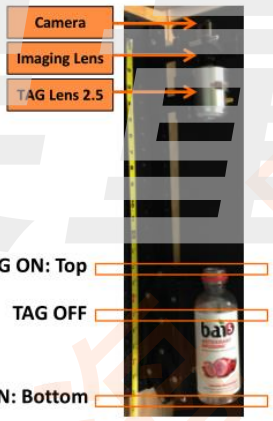
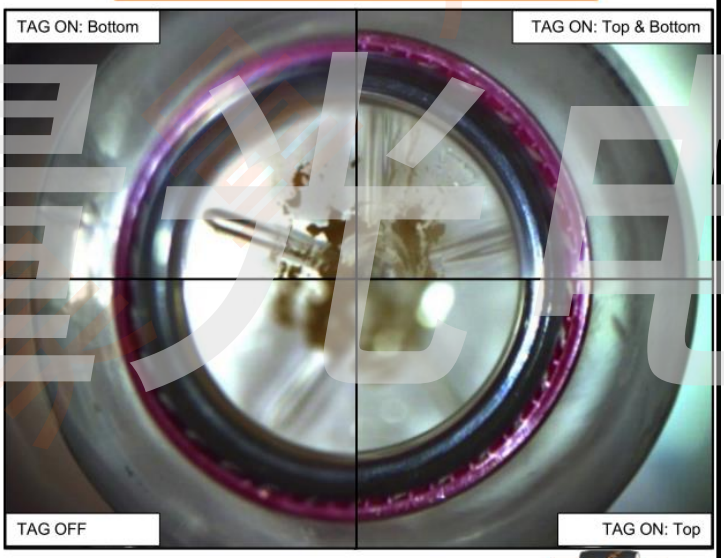
Imaging System:

- Primary Lens: **EO 25mm F1.4**
- Native DOF: **30 mm**
- Camera: **IDS 1/1.8 Chip**
- Illumination: **Pulse White LED**
- Sample : **Juice Bottle**



TAG Lens enables >12 X increase in DOF



Jan 2018 **Images shown above are raw and have not been digitally adjusted*

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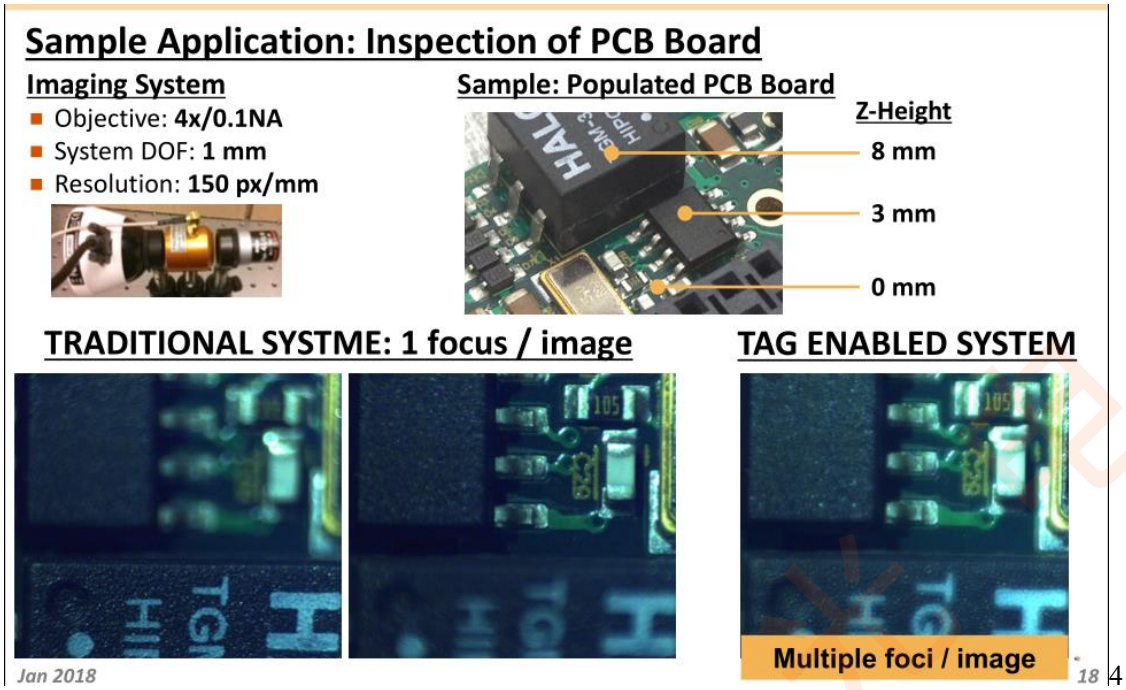

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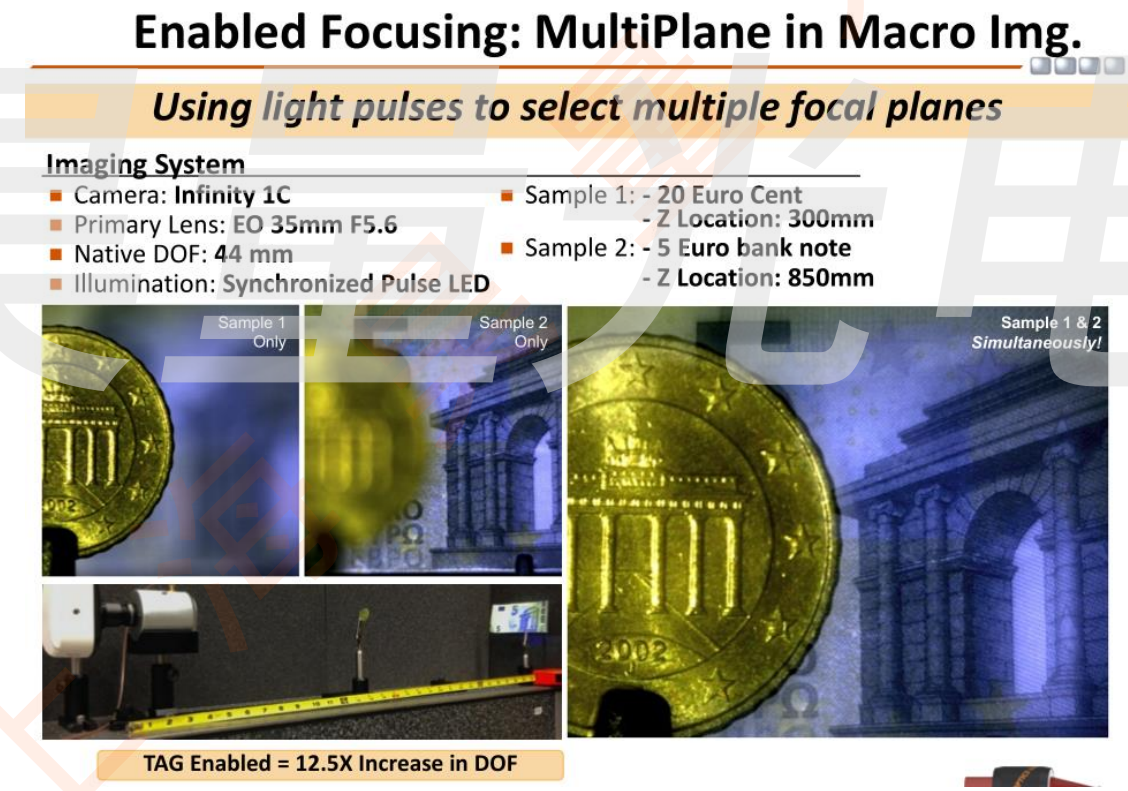

◆ **主要特点：**

可控制景深
实现实时 3-D 扫描
超快调节速度（亚微秒）
近衍射极限的分辨率
没有移动部件
方向无关
集成简单

◆ **主要应用**

机器视觉
工业部件成像
激光材料加工
生物显微镜
粒子技术

◆ **主要参数：**

System Specifications	TAG Lens 2.0	TAG Lens 2.5 β	TAG Lens HP β
Largest Effective Aperture (mm)	5.6	11	5.3
Recommended Frequency Range	130 to >1,000 kHz	60 to 750 kHz	90 to 400 kHz
Number of MFG Specified Lens State	4	11	4
Recommended Maximum Optical Power Density (W/cm 2)	0.7 - 1.0	0.3 - 0.5	100
Wavelengths Range (nm)	400-875 and 915-1350	400-875 and 915-1350	350 to 2,000
Average Transmission (%)	> 90	> 90	> 95
Static Index of Refraction	1.46	1.46	1.30