



## 光學照明裝置及其共焦顯微系統

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市場及需求： 自動化光學檢測設備 (Automated Optical Inspection, AOI)

### 技術摘要(含成果):

本發明提供一種照明設計，使得寬頻光譜源經過光空間調製器 (Spatial light modulator, SLM) 調製後仍然保有原寬頻光譜的光譜飽和性，透過適當設計的照明數值孔徑 (numerical aperture, NA)，使得個別波長的零階繞射光具有一特定發散角，進而使後端有限尺寸的光學系統可以接收到各個不同波長的來光，從而確保基於 SLM 的彩色共焦量測技術之準確度，能應用在半導體微凸塊等微觀三維形貌的快速重建與量測。

### 優勢:

相較於習用準直照明方式，利用適當設計的照明數值孔徑能夠引導寬頻光經過 SLM 及軸向色散元件，完整將飽和光譜送達待測物表面，因而提升基於彩色共焦原理的量測準確度。

### 競爭產品:

Rudolph Wafer Scanner™ 3880

### 專利現況:

本研究成果為高端半導體光學量測技術中的一項關鍵要素，技轉廠商已於公司內部開立開發專案，進行進一步的實用化與商業化。

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## OPTICAL ILLUMINATION DEVICE AND CONFOCAL MICROSCOPY SYSTEM USING THE SAME

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**Experience:** <http://140.112.14.7/~aoi/chen.html>



**Market Needs: Automated Optical Inspection (AOI)**

### **Our Technology:**

A system and method to bring the saturate light spectrum of a broadband light source to the sample to be measured via a Spatial light modulator (SLM). By properly designing the numerical aperture (NA) of the illumination system, the zero-order diffractive light of each individual wavelength has a certain extend angle, this ensures the measuring precision of chromatic confocal based on SLM, which can be applied in microstructure 3-D reconstruction and measurement such like semiconductor microbumps.

### **Strength:**

In contrast to the conventional collimated illumination, by utilizing a properly designed NA, the broadband light is guided through a SLM and axial chromatic dispersion element, a consequence saturated light can be brought to the sample surface, this ensures the precision of measurement result based on the principle of chromatic confocal.

### **Competing Products:**

Rudolph Wafer Scanner™ 3880

### **Intellectual Properties:**

The invention can be a key point on high-end semiconductor optical measurement, the domestic company had started up an inner project to promote this technique to a practical and commercial level.

### **Contact (do not need to fill out):**

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