



Robotic Supported Goniophotometry for Automotive Lighting 机器人汽车灯具配光检测系统

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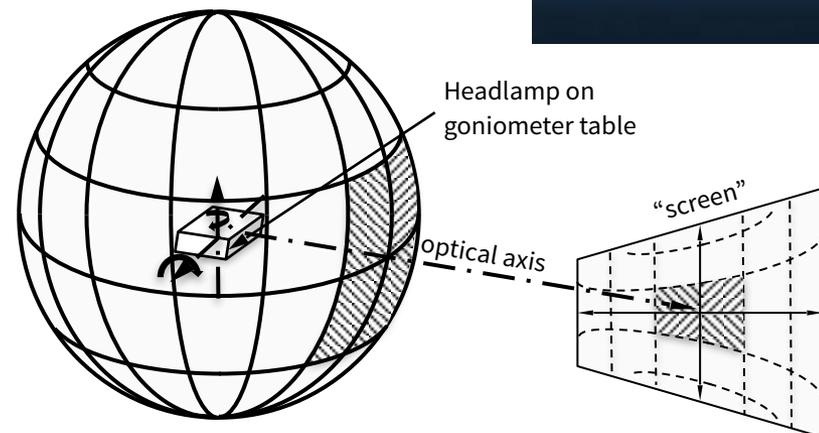




- Introduction 介紹
 - Measurement of XXL Objects
 - Summary
-
- Since introduction of LEDs in automotive lighting a universe of new geometric designs appeared on the market – among them extra-large luminaires which do not easily fit the standard goniophotometer.
 - 自从在汽车照明装置中引入LED以来，市场上出现了一系列新的几何设计 -其中超大型灯具不易与标准测角仪光度计配合检测。



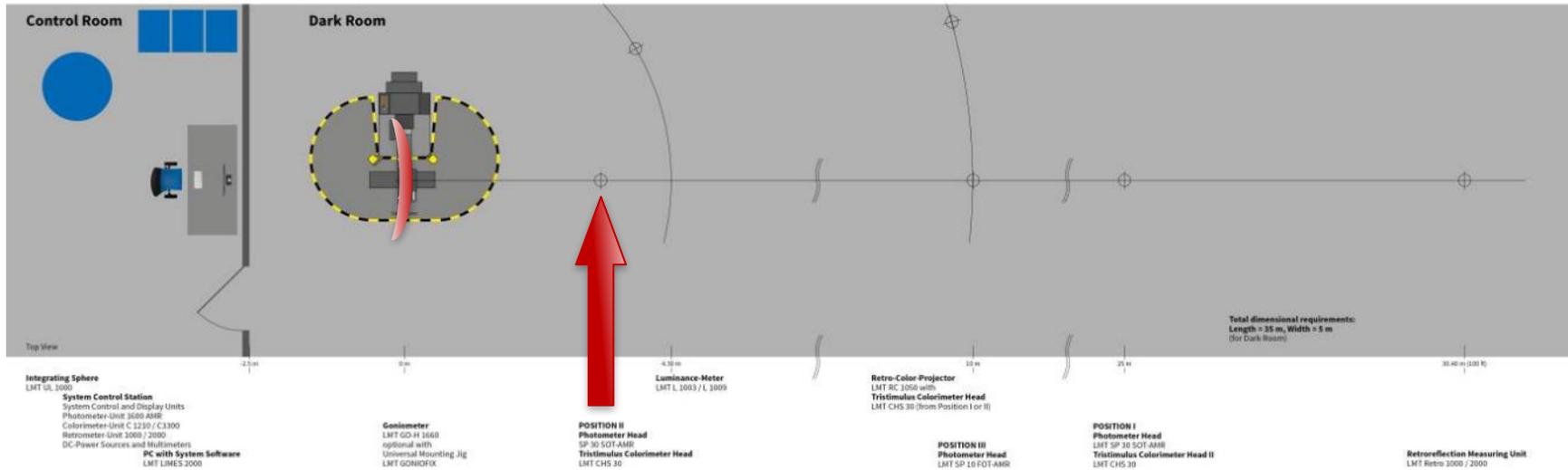
- Single arm A, α type goniometers are the global standard for automotive testing, the coordinate system fitting best to the well known wall projection
- 单旋臂A, α 型测角仪是汽车照明检测的全球标准, 坐标系最适合众所周知的墙投影
- Large test object clearance and ease of mounting
- 大的测试物件间隙和易于安装
- Full hemisphere scanning capability
- 全半球扫描功能
- Absolute optical angular encoders
- 绝对式光学角度编码器
- High precision 3-axis table
- 高精度3轴的工作转台



The Goniophotometric Laboratory



LMT ECE /SAE LABORATORY CONFIGURATION (Schematic)





Luminaires need to be divided into parts! 灯具需要被分成几部分测量!

- Low intensities, especially, for visibility requirements limit measurement distance to ≤ 5 m.
- 低光强，特别是对于能见度要求，将测量距离限制在 ≤ 5 米
- Far-field condition requires DUT size to be $\leq 10\%$ of the measurement distance.
- 远场条件要求，可测灯具尺寸为测量距离的10%



Measurement of large objects 大型照明灯具的测量



Luminaires need to be divided into parts! 灯具需要被分成几部分测量!

How to measure outer sections?
如何测量外部?

- Therefore, large objects have to be divided into smaller sections, for instance a DUT of 1.5 m dimension ends up in at least 3 sections of 50 cm.
- 因此，必须将大型灯具分成较小的部分，例如1.5米尺寸的灯具最终在3个50cm的部分测量才结束
- Each section must be centred for measurement in the goniometer origin
- 每个部分必须居中，以便在测角仪的光学中心进行测量



Fixtures get very large ... 夹具变得非常大



- Each section must be centred for measurement in the goniometer origin
- 每个部分必须居中, 以便在测角仪的
光学中心进行测量

- How to measure the opposite side?
- 如何测量对面的部份?
- Measure up-side down
- 测量上下倒置



Fixtures get very large ... 夹具变得非常大



- ... or use a mirrored goniophotometer
- ...或使用反射镜式测角光度计

- How to measure the opposite side?
- 如何测量对面的部份?
- Measure up-side down
- 测量上下倒置



The Solution: 6 Axis Robotic Goniometer



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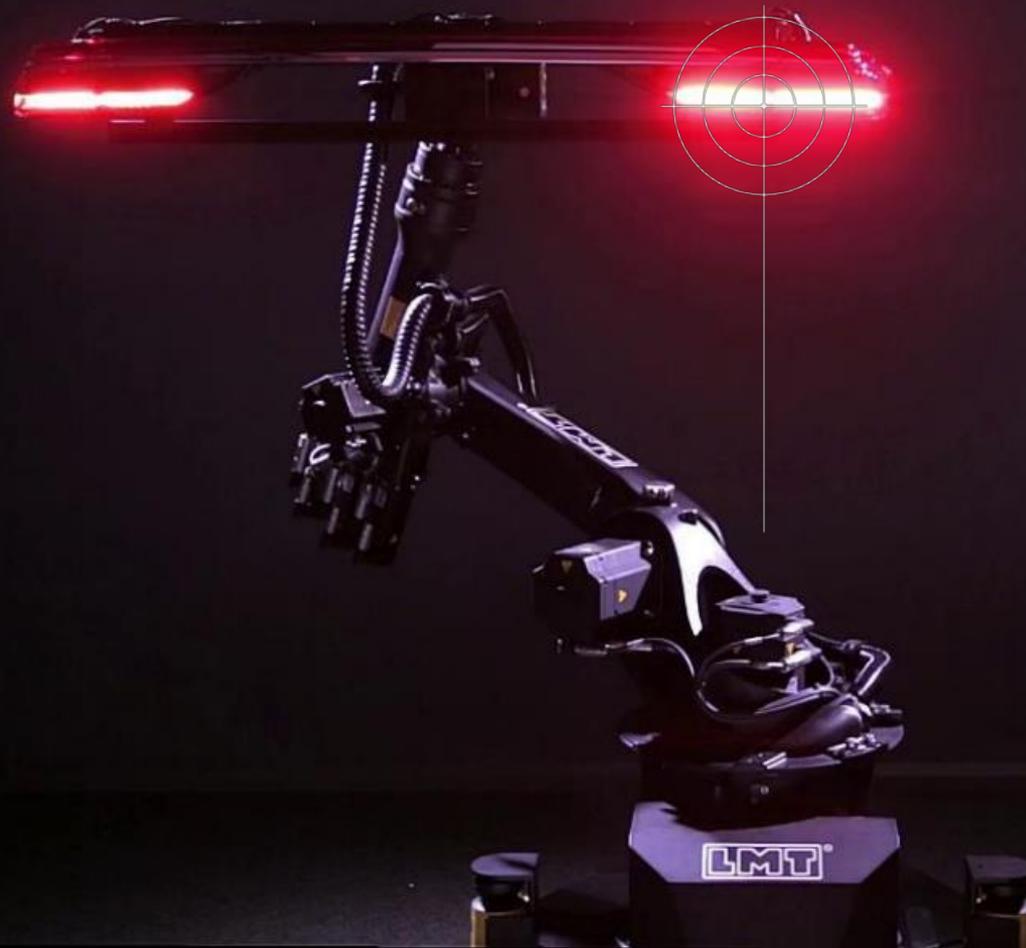
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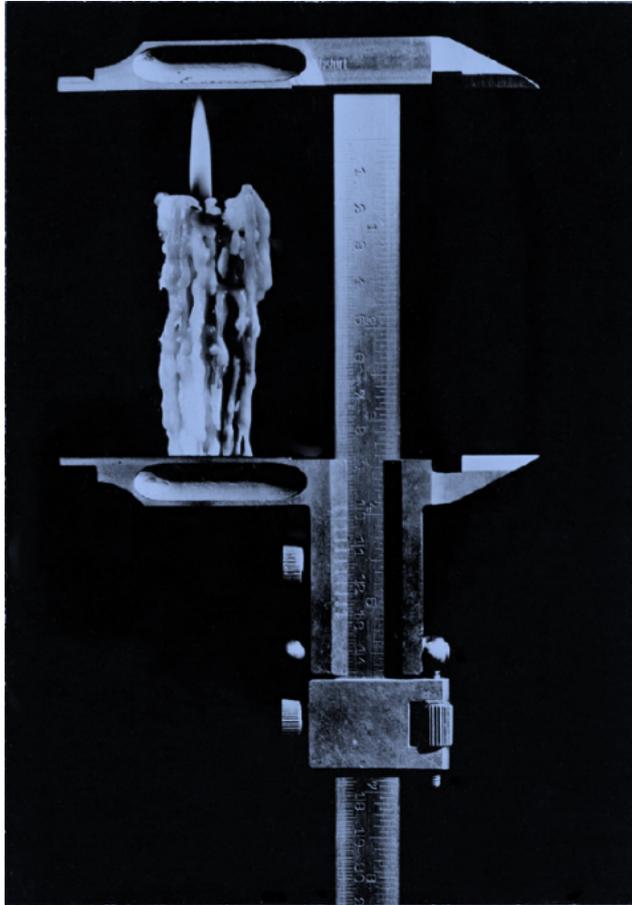


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LMT METROGON® in action





Thank you for your attention.