

SID Vehicle Displays and Interfaces 2013

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Recreating Daylight for Readability Assessments of In-Vehicle Displays



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Outline

- Readability in ambient light
- Ambient lighting for display metrology
- Recreating daylight
- Vehicle assessment facility
- Conclusions

Readability in ambient light



Jaguar Land Rover Ltd., 2012

- Ambient light affects readability of in-vehicle displays
- Perform assessments to verify software design
- Ensure optimal display location

Readability in ambient light



Loch Lomond, 15th September 2013

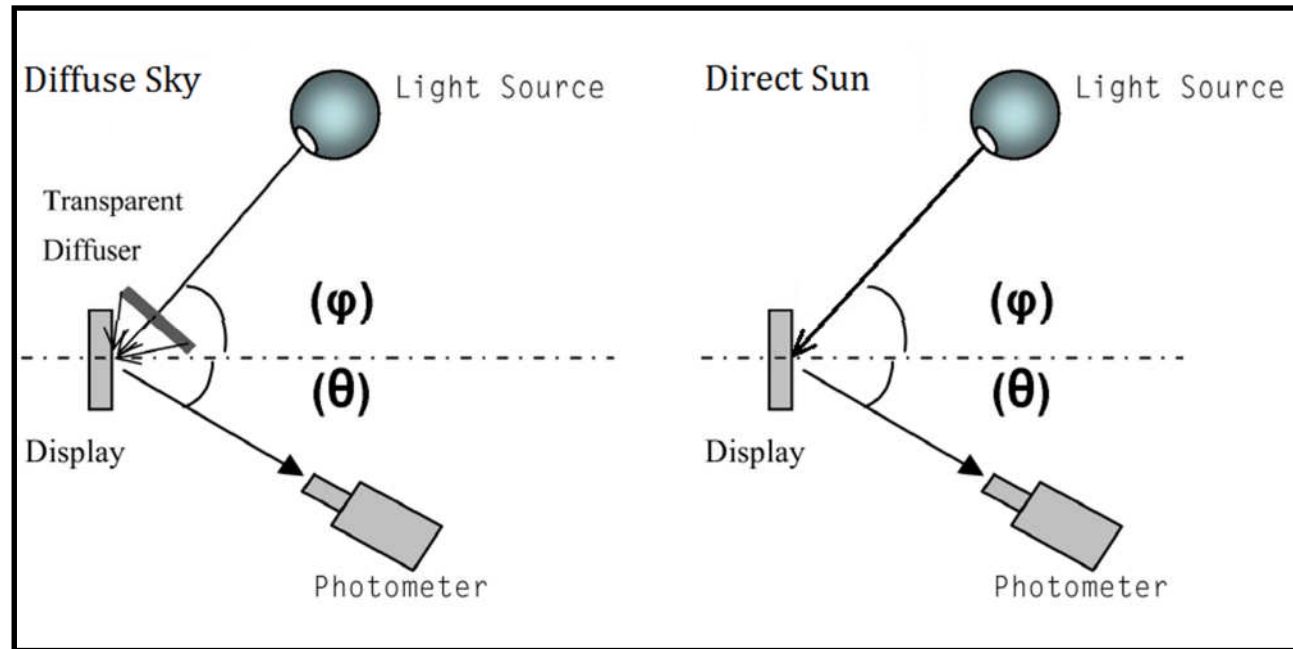
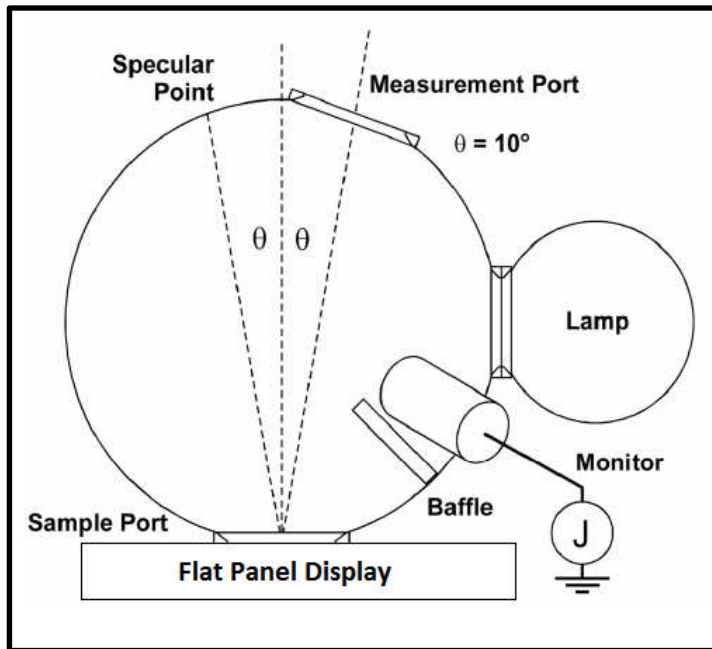
Readability in ambient light



Loch Lomond, 15th September 2013

Ambient lighting for display metrology

High ambient light illumination simulation



SAE J1757-1 Standard Metrology for Vehicular Displays, 2007

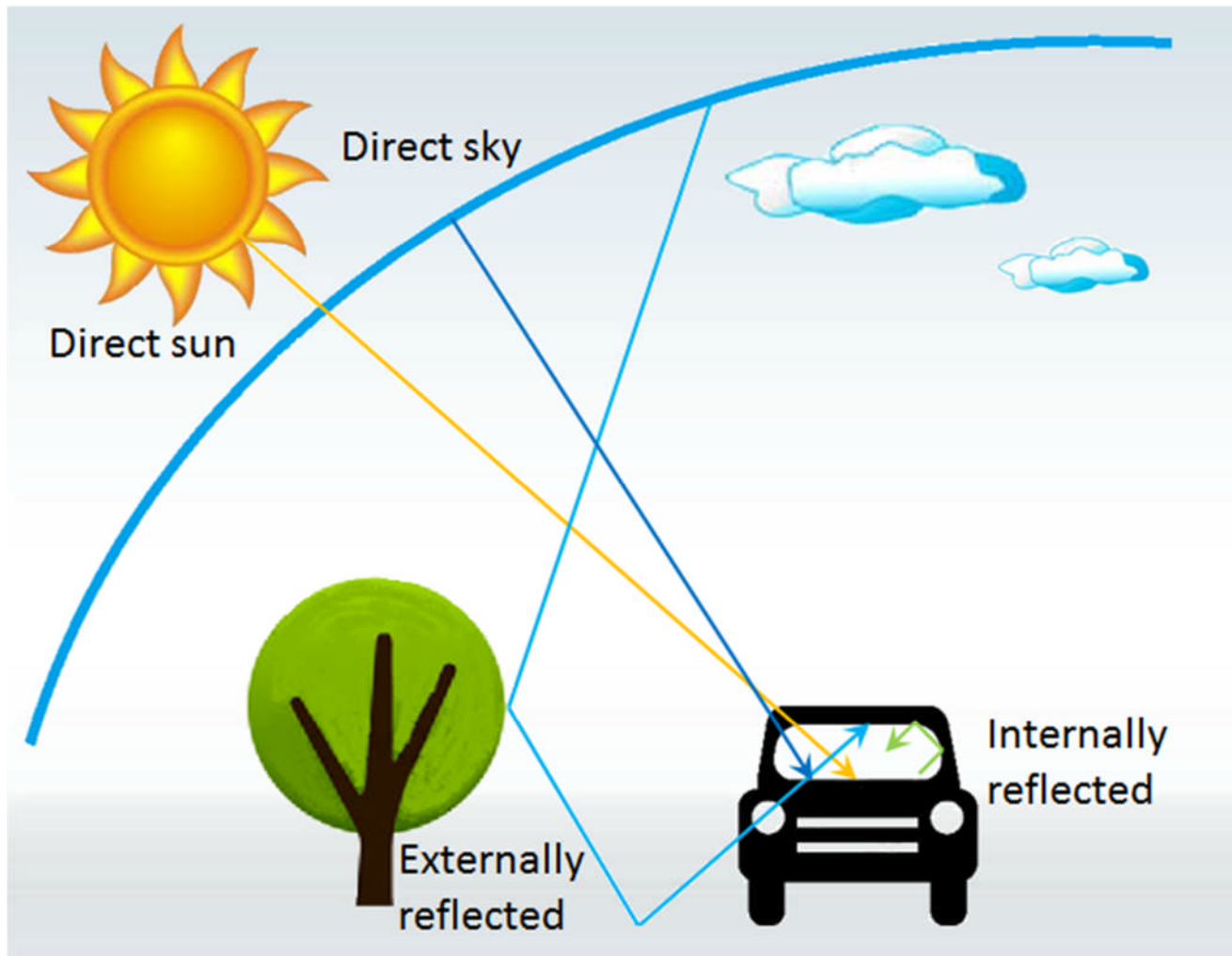
- Test bench or in-situ measurements
- Diffuse and direct illumination

Recreating daylight

Objectives of the project

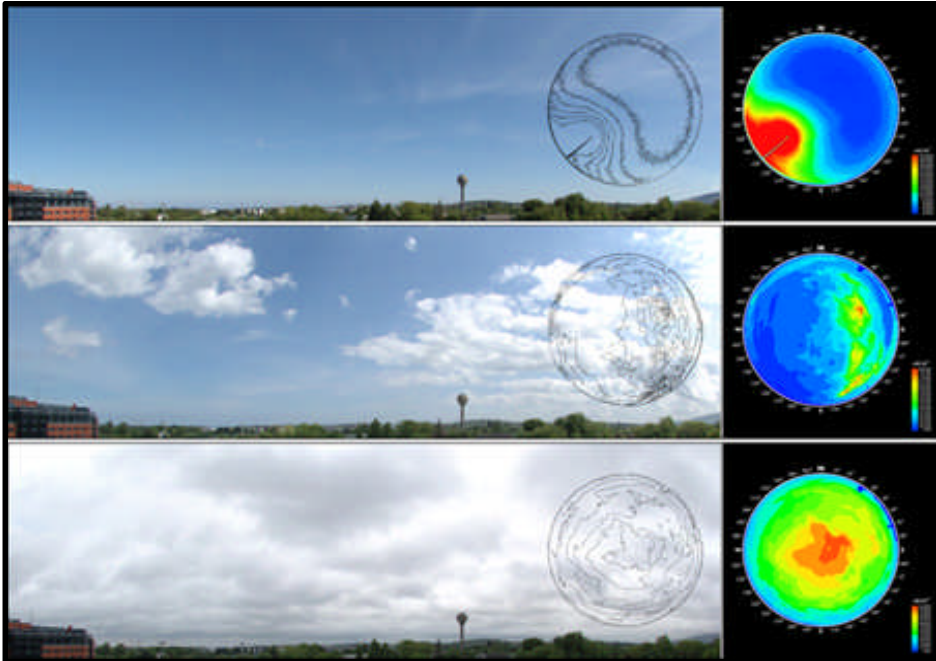
- Lighting facility
- Illumination scenarios
- Automotive procedure

Recreating daylight



Recreating daylight

Daylight capture and display readability



Whole Sky Luminance Mapping, Pro-Lite Technology, 2011

- Sky luminance & CCT
- CCD camera
- Sky type



Display readability assessment, WMG, 2012

- Illuminance and contrast
- PJND
- Camera mount

Recreating daylight

Daylight capture and display readability

- What is the influence of sky light on readability?
- Is diffuse hemispherical light sufficient to perform assessments?
- What are the 'worst-case' illumination scenarios with respect to readability?

Vehicle assessment facility

Current technologies



Ford Motor Company, Visual Performance Evaluation Lab , 2011



Alenia Aeronautica, Sky Light Simulator, 2009

Vehicle assessment facility

Current technologies



Peter Andres Lichtplanung, 2012



The Sky Project, University College Dublin, 2011

Vehicle assessment facility

Requirements for daylight simulation

- Sun simulator
- Artificial sky - diffuse hemisphere or point source?
- Photometric imaging equipment

Conclusions

- Vehicle Illumination Assessment Facility
- Sky Capture & Readability
- Do existing simulators recreate daylight?
- Challenges

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