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LIVIA LIGHT VISION ANALYSIS



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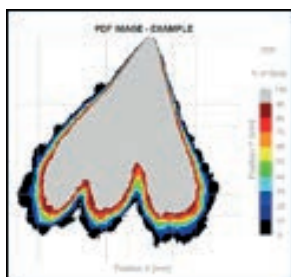
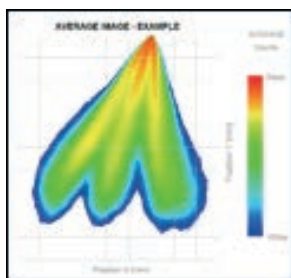
VISION SYSTEM FOR INJECTOR'S SPRAY

The development of injectors for direct injection applications is a challenge where a big part of it belongs to the spray geometry. The detailed characteristic behind this geometry can be measured in qualitative way with cameras and light source with a quite complex setups with several components to handle. Also, what makes the difference is the way to detect and post-analyze the data. Here comes the Livia system, developed to have one tool to handle the set up and make analysis on the data obtained.

THE SYSTEM

The Light Vision Analysis System, designed by Loccioni Group, is a tool that provides the acquisition and the analysis of injector's spray images.

The testing set up has a high intensity of light source and every camera has its own light triggered by the injector pulse. A real time logic and an industrial PC are included in order to provide fast digital signal generation, image acquisition and post-processing analysis. This system can be integrated in a production end-of-line test as well as in R&D testing laboratory.



Average and PDF image

MAIN CHARACTERISTICS

The main goals for the image acquisition are:

- > analysis of the spray's geometrical characteristics using high resolution cameras (penetration, spray angles, area distribution)
 - > analysis of dynamical effects, such as "bouncing effect" using High Speed Video Camera (HSV Camera)
 - > detection of the SOI using HSV Camera
- This instrument can be used for GDI, MPI and DCRI spray's evaluation. The system includes a post-processing SW developed by Loccioni, where there are algorithms able to detect the spray and make analysis on it.
- > Possibility to set up from 1 to 4 cameras
 - > Fast digital signals (TTL) generation system able to trigger cameras and light sources with the injector.
 - > Suitable for the image acquisition from Gigabit Ethernet cameras (GigE).
 - > Post-processing SW able to calculate main geometrical characteristics of the injector's spray.

THE SOFTWARE

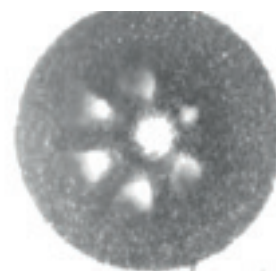
The software developed by Loccioni can acquire and analyze images in order to characterize injector's spray.

Image Acquisition:

- > Camera Trigger driven by a real time system
- > GigE communication for image transfer

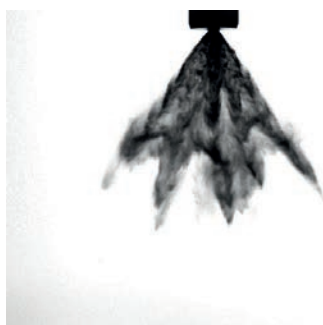
Analysis:

With the Loccioni analysis software, main geometrical characteristics such as penetration, spray angles and a redistribution can be calculated.

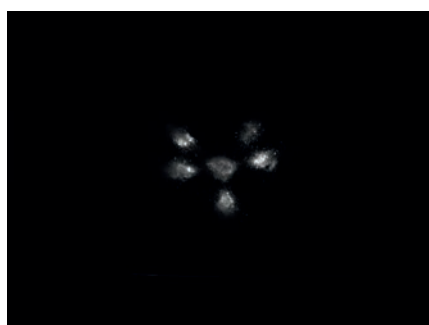


Start of Injection

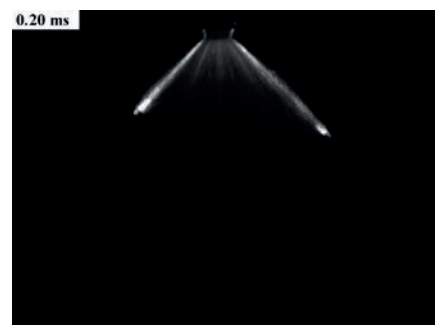
High resolution cameras for Spray Images
High Speed Video acquisition up to 1'000'000 fps
One compact solution for different devices management
Automatic detection and analysis of the spray



1 Shadowgraphy – Axial Global View



2 Mie scattering – Radial Cut View



3 Mie Scattering – Axial cut View