

Jet Fuel Testing

Water Slug Detection

Canty Representative: Keith DeMonstoy

Location: Paulsboro, NJ

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Introduction

Objective

The purpose of this test is to determine if a vision based system can detect a water slug within kerosene or jet fuel.

Sample Description

50/50 mix of kerosene and water

Figure 1 – Sample description

Typical Images

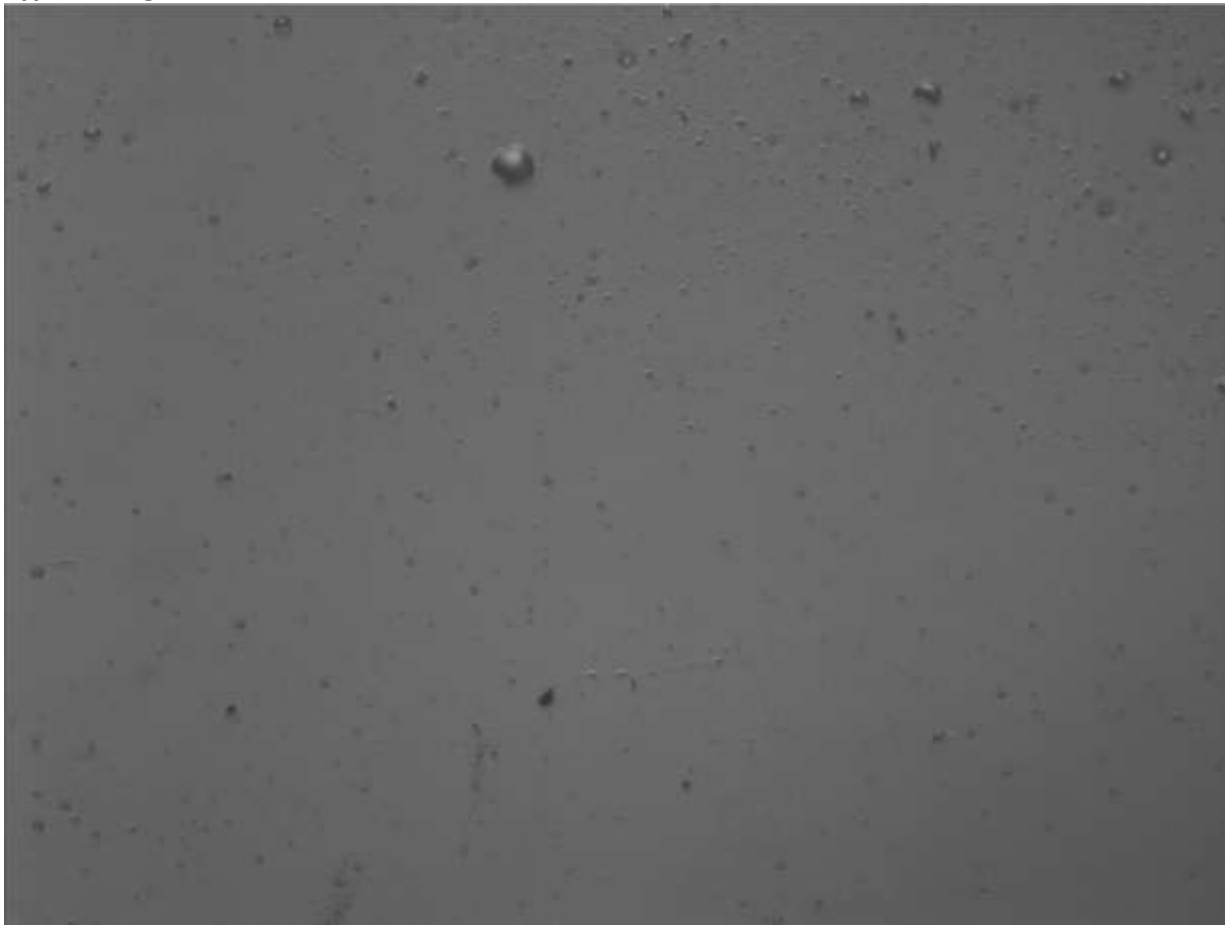


Figure 2 - Steady state before valve is opened. Small droplets can be seen.



Figure 3 - A large slug of material is seen as the valve is opened and the interface change is occurring in the flow cell.

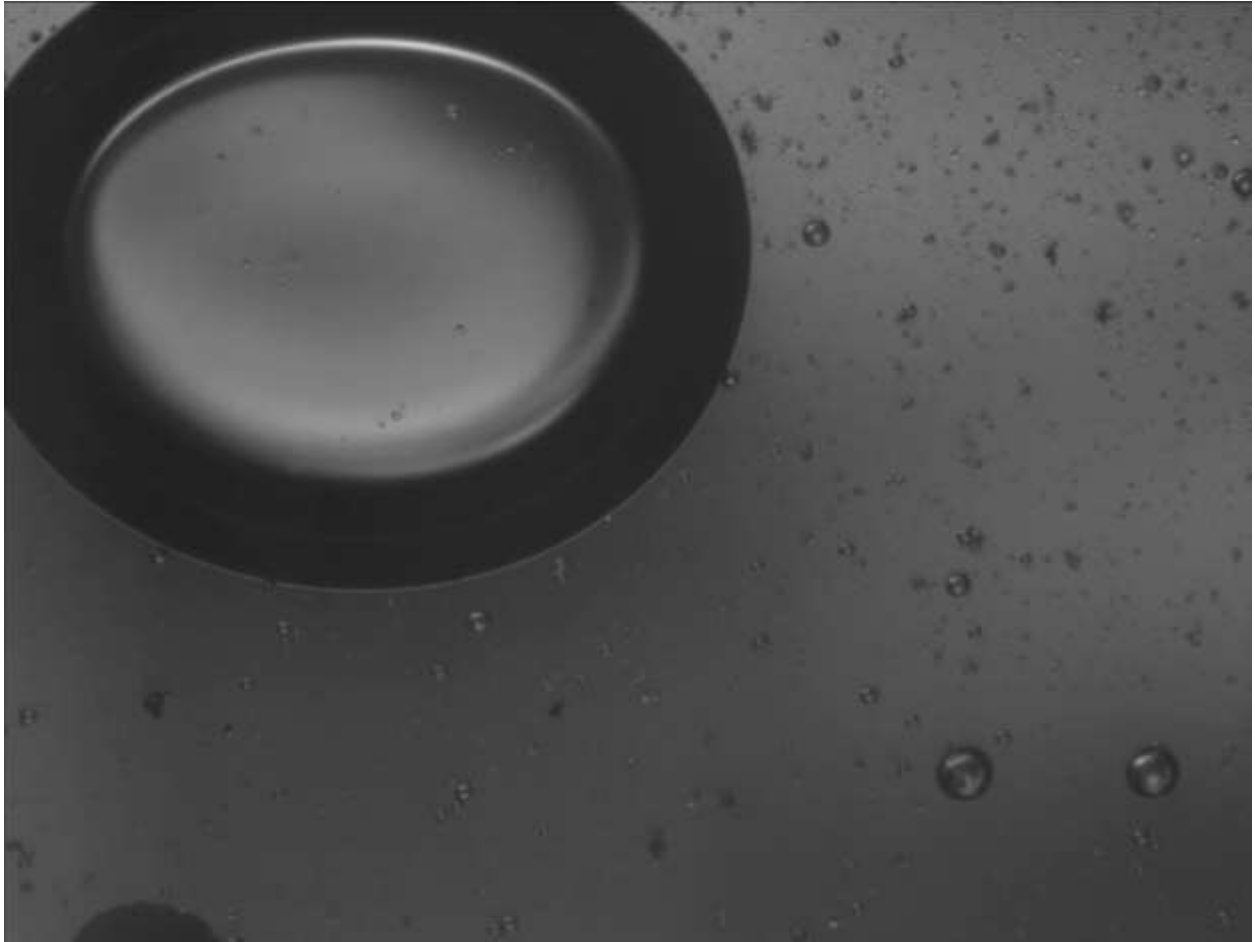


Figure 4 - Another example of a slug or large droplet

Data

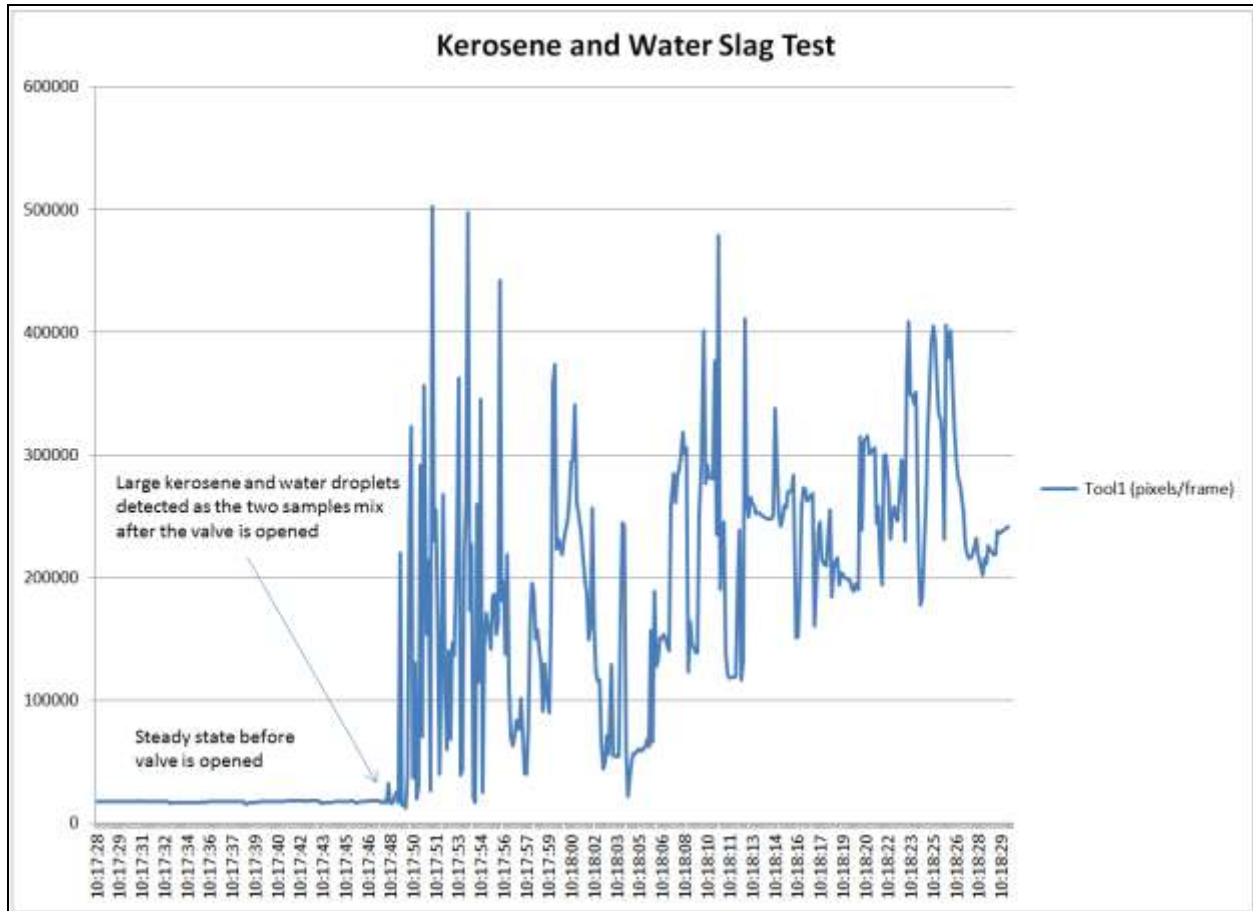


Figure 5

Discussion

As seen in figures 2-4, the visual evidence of large water droplets is present when the water and kerosene are allowed to mix after the valve has been opened. While in figure 5, the CantyVisionClient Software's color speck module has outputted the total area of all the droplets within the field of view for each frame. This detection of the large droplets is displayed by the large peaks that indicate a larger area of droplets has been detected by the system. These detections, as seen in figure 5, can be displayed locally and/or outputted to the control system for appropriate action.

Technical Setup Details

Operator:	KRD
Sample Number:	na
Company:	na
Rep:	na
Test Purpose:	Water in Kerosene

Test Setup:	
System Description:	TruFlow
Model #:	
Serial #:	
Software Version	19.31.1
Test Setup Notes:	

- Removed IR Filter
- Rotated light for max lighting
- Allowed the water and kerosene to separate - 50/50 mix
- Gravity fed top to bottom

Test Setup Notes:			
Weight or Concentration:	50/50 Water/Kerosene	Pixel Scale Factor	1.44 microns per pixel
Shutter Speed:	10	Aperture	na
Gain:	0	Light Filters	na
Light Intensity:	28VDC	Light Source	HYL80LS-WP
Gap:	500 Microns	Collimated LP	na
Flow Rate:	Gravity Fed	Light Guide	Quartz