



## Criminalistics Section – 2006

### **B171 Polarized Light Photography of Bloodstains on Dark Reflective Surfaces**

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The objective of this presentation is to introduce an improved method for photographic documentation of bloodstain patterns on dark reflective surfaces.

This presentation will impact the forensic community and/or humanity by introducing a time and cost-efficient way of improving the detection and photographic documentation of bloodstain patterns found on dark reflective surfaces, ultimately aiding reconstructive efforts.

Polarized light photography provides a nondestructive technique of documenting bloodstains on dark reflective substrates. Accurately visualizing and photo-documenting bloodstain patterns on an article of clothing can provide crucial information for crime scene reconstruction efforts.

Traditionally, black and white photography used color filters to either lighten or darken a stain against the surrounding background to elucidate the forensic information contained on a difficult substrate. However, this technique provides little benefit with bloodstains on very dark or black surfaces. Observing and documenting bloodstains on dark reflective surfaces is problematic due to the glare reflected off of the surface as well as the lack of contrast between the stain and substrate.

Previous studies have shown the usefulness of chemical enhancement techniques on bloodstain patterns, including Luminol, amido black, and leucocrystal violet, with the drawback of potentially compromising DNA analysis and altering the stains. Performing background corrections on digital images and the combination of digital photographs taken at two or three wavelengths have also been shown to lead to enhanced visualization of blood on some strong colored substrates.

Photography represents a nondestructive method of documenting stains. Traditional photography has limited applicability to dark, reflective surfaces where the investigator is attempting to demonstrate the position of dark, reflective bloodstain patterns.

This study introduces an improved method of photographing these dark, bloodstained substrates without the use of specialized film needs or digital imaging operations and that has applicability to digital photography as well.

Criminal cases involving bloodstains on a dark nylon jacket and a black leather jacket prompted experimentation with different types of illuminators and filters. The combination of a plane polarized filter over the illuminator in conjunction with a polarizing filter fitted over the camera lens resulted in a significant improvement in the contrast of images obtained.

Further experimentation is being done with a variety of bloodstained, dark reflective fabric substrates in order to optimize the lighting angle, direction of vibration of the plane polarized light, and camera settings. The results of these experiments will be shared in this presentation.

#### **Photography, Polarized Light, Bloodstain Patterns**