Abstract Submitted
for the DFD17 Meeting of
The American Physical Society

High-speed video analysis of forward and backward spattered blood droplets[1] PATRICK COMISKEY, ALEXANDER YARIN, Univ of Illinois - Chicago, DANIEL ATTINGER, Iowa State University — High-speed videos of blood spatter due to a gunshot taken by the Ames Laboratory Midwest Forensics Resource Center are analyzed. The videos used in this analysis were focused on a variety of targets hit by a bullet which caused either forward, backward, or both types of blood spatter. The analysis process utilized particle image velocimetry and particle analysis software to measure drop velocities as well as the distributions of the number of droplets and their respective side view area. This analysis revealed that forward spatter results in drops travelling twice as fast compared to backward spatter, while both types of spatter contain drops of approximately the same size. Moreover, the close-to-cone domain in which drops are issued is larger in forward spatter than in the backward one. The inclination angle of the bullet as it penetrates the target is seen to play a significant role in the directional preference of the spattered blood. Also, the aerodynamic drop-drop interaction, muzzle gases, bullet impact angle, as well as the aerodynamic wake of the bullet are seen to greatly influence the flight of the drops. The aim of this study is to provide a quantitative basis for current and future research on bloodstain pattern analysis.

[1]This work was financially supported by the United States National Institute of Justice (award NIJ 2014-DN-BXK036).

Patrick Comiskey
Univ of Illinois - Chicago

Date submitted: 15 Jun 2017 Electronic form version 1.4