Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Surface evolution effects observed in velocimetry of materials at high strain rates ERIK MORO, MATTHEW BRIGGS, LAWRENCE HULL, Los Alamos National Laboratory — According to the accepted model for photon Doppler velocimetry (PDV), a particular probe measures the bulk (or average) motion of a surface moving along its beam axis. Utilizing this model, a surface's velocity vector may be reconstructed via a number of probes, at distinct angles of incidence, all of which view the same region on the surface. However, this approach does not account for localized effects of surface evolution, which may interact with PDV's interferometer in ways that are not yet fully appreciated. Consider, for example, that the material flow of a straining surface occurs tangent to the surface and may project along the beam axes of non-normal probes. We present a recent series of explosive tests, whose results suggest that non-normal PDV probes measure the effects of surface evolution as it projects along their beam axes. We believe that these effects have not been observed before. The implication is that PDV probes are capable of measuring the bulk motion of a surface, as well as measuring discrete events associated with surface evolution and failure.

Matthew Briggs
Los Alamos National Laboratory

Date submitted: 14 Nov 2013 Electronic form version 1.4