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**Fundamental Experiments in Velocimetry** MATTHEW BRIGGS, DAVID HOLTKAMP, LARRY HULL, MICHAEL SHINAS, Los Alamos National Lab — One can understand what velocimetry does and does not measure by understanding a few fundamental experiments. Photon Doppler Velocimetry (PDV) is an interferometer that will produce fringe shifts when the length of one of the legs changes, so we might expect the fringes to change whenever the distance from the probe to the target changes. However, by making PDV measurements of tilted moving surfaces, we have shown that fringe shifts from diffuse surfaces are actually measured only from the changes caused by the component of velocity along the beam. This is an important simplification in the interpretation of PDV results, arising because surface roughness randomizes the scattered phases.

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