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New developments in PDV

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Photon Doppler velocimetry (PDV) has made the transition among many experimental groups from being a new diagnostic to being routinely fielded as a means of obtaining velocity data in high-speed test applications. Indeed, research groups both within and outside of the shock physics community have taken note of PDV's robust, high-performance measurement capabilities. As PDV serves as the primary diagnostic in an increasing number of experiments, it will continue to find new applications and enable the measurement of previously un-measurable phenomena. This paper provides a survey of recent developments in PDV system design and feature extraction as well as a discussion of new applications for PDV. More specifically, changes at the system level have enabled the collection of data sets that are far richer than those previously attainable in terms of spatial and temporal coverage as well as improvements over PDV's previously measurable velocity ranges. And until recently, PDV data have been analyzed almost exclusively in the frequency-domain; although the use of additional data analysis techniques is beginning to show promise, particularly as it pertains to extracting information from a PDV signal about surface motion that is not along the beam's axis.