

Evaluating Intensified Camera Systems

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Abstract

This paper describes image evaluation techniques used to standardize camera system characterizations. Our group is involved with building and fielding several types of camera systems. Camera types include gated intensified cameras, multi-frame cameras, and streak cameras. Applications range from X-ray radiography to visible and infrared imaging. Key areas of performance include sensitivity, noise, and resolution. This team has developed an analysis tool, in the form of image processing software, to aid an experimenter in measuring a set of performance metrics for their camera system. These performance parameters are used to identify a camera system's capabilities and limitations while establishing a means for camera system comparisons. The analysis tool is used to evaluate digital images normally recorded with CCD cameras. Electro-optical components provide fast shuttering and/or optical gain to camera systems. Camera systems incorporate a variety of electro-optical components such as microchannel plate (MCP) or proximity focused diode (PFD) image intensifiers; electrostatic image tubes; or electron-bombarded (EB) CCDs. It is often valuable to evaluate the performance of an intensified camera in order to determine if a particular system meets experimental requirements.

Keywords: image intensifier, CCD camera, radiography, electro-optic, imaging, performance

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