

Implications of Solid State Light Sources to Visual System Design; Radiometric Stability and Contrast Optimization

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Abstract

Within simulation applications, market share continues to grow for projectors with a Solid State light source. These sources, namely; Light Emitting Diode, Laser Hybrid (Laser-Phosphor and Laser-LED Combinations) and Direct Laser, have been shown to maintain lumen output well beyond the latest Arc-Lamp sources. Anecdotal evidence also suggests that these have significantly improved image stability compared to Arc-Lamp sources. This paper foremost summarizes temporal and thermal radiometric stability data collected on projectors with solid state light sources and DLP imaging panels, using a representative LCOS and Arc-Lamp projector as a benchmark. With stability and relative performance quantified, Visual System Design implications are considered. In particular, radiometric stability enhancements and imaging panel performance limitations imply new priorities for Alignment System Design, Display System Design and Image Generation Methods.