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Title

Multi-spectral Projector for Hardware-in-the-Loop Simulation (HWILS) using Micro Interferometer Arrays

SBIR Topic Number

AF05-310

Summary Report Type

Phase I Summary

Summation

In phase I, we set out to develop a micro Fabry-Perot interferometer (MFPI) array capable of mitigating most, if not all, limitations of the micro resistor and micro mirror arrays currently used in projecting scenes. The model and the design of the MFPI array and the delineated process for fabrication made in Phase I show that it is feasible to fabricate four separate arrays, covering the entire spectral range from UV to LWIR, to construct a multi-spectral projector system. Based on the modeling and analytical results obtained, we conclude that the MFPI projector system is capable of projecting complex scenes with a 100 Hz frame rate, a 640x480 spatial resolution, 1,000:1 dynamic range and a UV-LWIR spectral coverage.

Anticipated Benefits

The micro Fabry-Perot interferometer (MFPI) array, due to its pixel-by-pixel spectral tunability, has diverse applications beyond scene generation that include: (1) free-space optical communications in the near infrared to the long wave infrared; (2) toxic, polluting and biological gas and gas cloud sensing; (3) hyper-spectral imaging; and (4) image display.

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