NASA SBIR/STTR Technologies

Proposal No.: A2.08-9753

An All Electronic, Adaptive, Focusing Schlieren System for Flight Research

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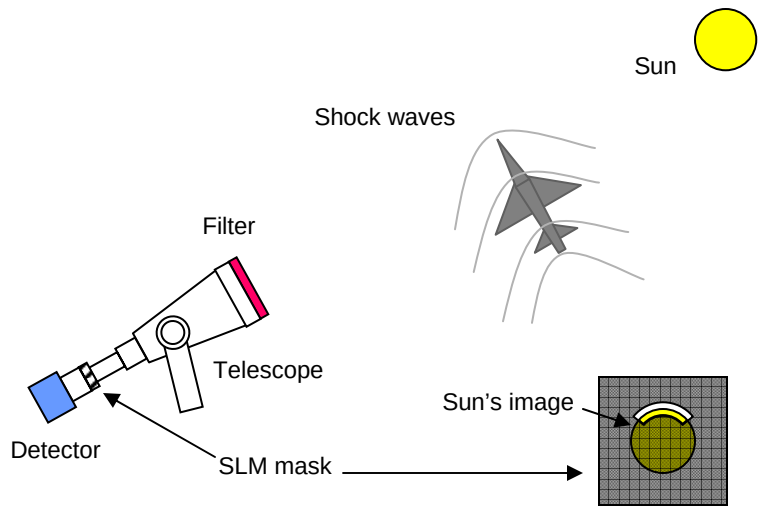
Identification and Significance of Innovation

Proposal to use spatial light modulators (SLMs) as electronically programmable masks for large-field schlieren camera systems. Recently, schlieren systems that use the sun as a background source have been developed for studying shock waves for aircraft in flight. The application of schlieren techniques is restricted by the capabilities of fixed schlieren cut-off masks. Programmable masks can remove this limitation.

Expected TRL Range at the end of Contract (I-9): **Level 4** Component and/or breadboard validation in laboratory environment.



Technical Objectives and Work Plan

Evaluate the potential of SLMs in both Lens and Grid Schlieren and in scanning schlieren systems, especially those used for Schlieren for Aircraft in Flight.

1. What are the tradeoffs involved in substituting spatial light modulators in place of fixed schlieren cutoff masks?
2. What hardware is needed to address and update the spatial light modulator?
3. What new capabilities are afforded by using spatial light modulators as dynamically programmable schlieren masks?

NASA and Non-NASA Applications

Flight testing is often used as a final critical check of the aerodynamic designs developed by computational and wind tunnel methods because the amount of reliable information obtainable in wind tunnels is somewhat limited and subject to interference. Potential commercial applications include aero-optics, flow diagnostics, active laser imaging, and high-resolution imaging.

Firm Contacts

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NON-PROPRIETARY DATA