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Toward an automated background oriented schlieren (BOS) system MICHAEL HARGATHER, Gas Dynamics Laboratory, Penn State University, GARY SETTLES[1], Penn State University — The background oriented schlieren (BOS) technique is a useful method for visualizing refractive disturbances in a wide range of experimental settings. The technique visualizes refractive disturbances via their distortion of a distant background pattern (typically a speckle pattern). A cross-correlation computer algorithm is typically used to identify and measure distortions of the background pattern, thus revealing the refractive disturbance changes between images and producing a schlieren image. The cross-correlation algorithm, however, can be time-consuming and prevents an instantaneous schlieren image from being observed, thus hampering some potential BOS applications. Here a novel background patterning approach is presented which eliminates the need for the cross-correlation algorithm. Results are presented showing the sensitivity of the new background pattern and its potential application for providing instantaneous BOS images. Background pattern characteristics are explored for high- and low-speed fluid-dynamic applications.

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