

Abstract Submitted
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Rubidium Atomic Line Filtered (RALF) Doppler Velocimetry

MARIO FAJARDO, CHRISTOPHER MOLEK, ANNAMARIA VESELY, US Air Force Research Lab, LASEM TEAM — We report our progress towards adapting the well-known Global Doppler Velocimetry (GDV) technique, popular in the aerodynamics community, to the order-of-magnitude higher velocities pertinent to shock experiments. In GDV, the narrow-line illumination laser is tuned to an edge of a molecular iodine absorption line; an iodine gas cell converts the Doppler shift of the reflected light to transmitted intensity. We follow the suggestion in the original 1990 patent by Komine and broaden the absorption lines of alkali metal atoms by adding a buffer gas, thereby tuning the transmission edge spectrum to match the Doppler shift (surface velocity) range of interest. We use atomic rubidium vapor cells, with 0 to 1 atmosphere pressures of molecular nitrogen buffer gas, and coin the name “Rubidium Atomic Line Filtered” (RALF) Doppler velocimetry. [96ABW-2013-0036]

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