

Abstract Submitted
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Mach Number Effect on the Characteristics of a Free Pulsed Jet

ISAAC CHOUTAPALLI, The University of Texas - Pan American — An experimental study was carried out on a free pulsed jet over a Mach number range of 0.3 to 0.8. The data was obtained using Particle Image Velocimetry (PIV). The global flow field of the pulsed jet showed that over the range of Mach numbers considered, the centerline velocity decay, jet spreading and the normalized mass flow rate for a given Strouhal number ($St = fd/U_j$; where f is the frequency of pulsation, d is the nozzle exit diameter and U_j is the time-averaged axial velocity at the nozzle exit) are only weakly dependent on the nozzle exit Mach number. The phase-averaged results show that the vortex ring circulation is also weakly dependent on the nozzle exit Mach number for a given Strouhal number. The vortex ring pinch-off was found to be independent of the nozzle exit Mach number but dependent on the pulsing frequency.

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