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Multi-Jet Impingement Array Performance[1] ESCALLE THIBAUD, St. Cyr Military Academy, DAVID HELMER, MICHAEL BENSON, U.S. Military Academy — Impinging jets are frequently used in applications requiring cooling, and the design of such arrays requires understanding of both fluid dynamics and convective heat transfer. While impinging jet arrays have been extensively studied historically, there remain relatively few combined velocity and heat transfer datasets. This report presents such coupled measurements for an impinging jet array, including three-dimensional, three-component velocity measurements acquired using Magnetic Resonance Velocimetry, as well as full-field heat transfer measurements acquired with steady-state IR thermography with a joule-heating boundary condition. The goal of this measurement is to provide a benchmark dataset against which future experiments and especially simulations can be validated in detail.

[1]Combat Capabilities Development Center: Armaments

Michael Benson
U.S. Military Academy

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