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**Full-field Mean Velocity Measurements inside a Scaled Metal Foam Replica using Magnetic Resonance Velocimetry** ANDREW ONSTAD, Mechanical Engineering, Stanford University, FRANCISCO MEDINA, Mechanical Engineering, University of Texas at El Paso, CHRIS ELKINS, Mechanical Engineering, Stanford University, RYAN WICKER, Mechanical Engineering, University of Texas at El Paso, JOHN EATON, Mechanical Engineering, Stanford University — Metal foams have gained interest in heat transfer applications due to their large convective surface area and high thermal conductivity. The flow passage through the foam is very complex suggesting the likelihood of high thermal transport coefficients. Furthermore, some thermal measurements indicate highly non-uniform flows in the foam interior. We examine the flow behavior inside the foam quantitatively using Magnetic Resonance Velocimetry (MRV). The technique is capable of measuring the three-component, mean velocity field within complex geometries without optical access or the use of flow tracers. To create the MR compatible replica, a 4 pore/cm aluminum foam specimen was imaged at a resolution of 36$\mu$m using an x-ray Computed Tomography (CT) scanner, scaled up by a factor of 4, then reconstructed in plastic by stereolithography (SLA). The spatially resolved, 3D mean velocity field was then measured by MRV where contrast enhanced water flowed through the foam replica at $Re_{Pore} = 730$.

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