

Abstract Submitted  
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**Comparison of Experimental and Computational Methods in the Study of Flow in Porous Media**<sup>1</sup> JAMES LIBURDY, Oregon State University, VISHAL PATIL, Malvern Instruments, JUSTIN FINN, University of Liverpool, SOURABH APTE, Oregon State University — Both experimental and computational methods applied to the study of porous media flows are challenging due to the complex multi-phase geometry and ability to resolve scales over a reasonably large domain. This study compares experimentally obtained results based on refractive index matching of detailed velocity field vectors with those obtained using direct numerical simulations to evaluate both methods for consistency. Data were obtained in a randomly packed bed using uniformly sized spherical particles. Challenges associated with proper experimental methods including refractive index matching errors, magnification uncertainties, and the identification of the proper geometry are discussed. In addition the DNS challenges associated with, matching the geometry, grid resolution particularly near solid contact points, and proper boundary conditions are presented. Results are compared, with attention paid to identifying the relative uncertainty limitations based on the experimental and computational parameters for steady flow conditions within the bed.

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