

Application of Digital Image Correlation to infer Multiphase Pore-scale Flow Dynamics

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Abstract. *Our aim is to infer pore-scale flow dynamics from static scans of the physical system at different times. Our approach is based on Digital Image Correlation (DIC), a technique which is mostly employed to derive displacement and strain fields from image sequences. We believe that we can extend the classical algorithm, by applying DIC separately to each phase and by imposing physical constraints on the solution. In this contribution, we first introduce the pore-network model which we use both for generating 2D synthetic data and to validate the derived flow fields. Then, we describe the classical DIC approach and the specific modifications to render it applicable for multi-phase flows. We conclude by critically reviewing our first results.*