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Impact of wettability correlations on multiphase flow through porous media MARTA SANCHEZ DE LA LAMA, MARTIN BRINKMANN, STEPHAN HERMINGHAUS, Max-Planck Institute Dynamics-Self Organization (MPI-DS), 37073 Goettingen (Germany) — In the last decades, significant progress has been made toward understanding the multiphase displacement through porous media and the role of substrate properties like homogeneous wettability or pore geometry. However, the effect of heterogeneous wettability at microscopic scales and its relation to large-scale properties, like relative permeability or capillary pressure, remains still little understood. In the present study forced imbibition through a two-dimensional porous medium is simulated at the pore scale by means of a mesoscopic particle approach [1,2]. The substrate is described as an assembly of non-overlapping circular disks whose preferential wettability is distributed according to prescribed correlations, i.e., from pore scale in terms of Janus beads up to domains at system scale. We analyze how this well-defined heterogeneous wettability affects the dynamics and try to establish a relationship among wettability-correlations and large-scales properties of the multiphase flow. References [1] Y. Inoue et al., J. Comp. Phys. 201, 191 (2004) [2] G. Gompper et al., Adv. Polym. Sci. 221, 1 (2009)

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