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Permeability modification and scaling of flow velocities in porous media SHIMA PARSA, ANDRES GONZALEZ, Rochester Institute of Technology — Permeability modifications and conformance control in porous media have an essential role in applications such as prevention of bioclogging in water filters and oil recovery. We use confocal microscopy and bulk transport measurements to probe the local flow and permeability of the medium in 3D porous micromodels. Using two different methods, we modify the available network of pores to reduce permeability and probe the local flow: 1) polymer retention and 2) immiscible trapping. We find that the average flow velocities scale with permeability and poorly with porosity. These methods of permeability reduction are dynamically modifying the permeability and are dictated by the network of pores. Furthermore, the distribution of velocities retain the same shape after considerable reduction in permeability in polymer retention but not in immiscible trapping. This is because of the gradual change in permeability in polymer retention.

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