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Percolation and hysteresis in macroscopic capillarity

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The concepts of relative permeability and capillary pressure are crucial for the accepted traditional theory of two phase flow in porous media. Recently a theoretical approach was introduced that does not require these concepts as input [1][2][3]. Instead it was based on the concept of hydraulic percolation of fluid phases. The presentation will describe this novel approach. It allows to simulate processes with simultaneous occurence of drainage and imbibition. Furthermore, it predicts residual saturations and their spatiotemporal changes during two phase immiscible displacement [1][2][3][4][5].

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