



## **It's not just the air-water interface: role of pore domain geometry and colloid-colloid interaction in filtration**

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The role of the dynamic air-water interface is an important focus for investigations of colloid transport in the unsaturated zone. However, the apparent assumption that the role of the water-solid interface is already well understood is incorrect. Existing filtration theory fails when an energy barrier is present between the colloid and the solid surface (predominant in environmental systems). Novel mechanisms of filtration in the presence of an energy barrier were recently inferred from pore-scale experiments. We present mechanistic simulations that confirm these mechanisms, and demonstrate the predominance of pore domain geometry and colloid-colloid interaction in controlling colloid deposition in the presence of an energy barrier. Incorporation of these influences into colloid transport models will be necessary for simulating colloid in both the unsaturated and saturated zones.