

Abstract Submitted
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The Mechanism behind Erosive Bursts in Porous Media¹ ROBIN JAEGER, MILLER MENDOZA, HANS HERRMANN, ETH Zurich — We implemented a new model based on the Lattice Boltzmann method to simulate erosion and deposition in suspension flows through porous media. Using this model we show that the cause of erosive bursts in filtration experiments is the re-opening of clogged pores when the pressure difference between two opposite sites of the pore surpasses a certain threshold. We perform numerical simulations and find excellent agreement to experimental results when comparing shape and size distribution of pressure loss jumps, which are the direct result of erosive bursts. Furthermore, we find that erosive bursts only occur for pressure gradient thresholds within the range of two critical values, independent on how the flow is driven. We believe that our findings provide a better understanding of sudden sand production in oil wells and breakthrough in filtration.

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