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Autocatalytic Reaction and Flow in Porous Media SEVERINE ATIS, HAROLD AURADOU, LAURENT TALON, CNRS, DOMINIQUE SALIN, UPMC — Universités Pierre et Marie Curie, Paris Sud and CNRS. Laboratoire FAST, Bâtiment 502, UPS, 91405 ORSAY Cedex France. Coupling between autocatalytic reaction front and simple hydrodynamic flows leads to front patterns revealing the underlying flow field [1]. Flow of a passive tracer, i. e. a dye, through the complex flow field of a porous medium leads to the so-called hydrodynamic dispersion which accounts for the mixing process inside the medium [2]. We have performed experiments and numerical simulations of the propagation of reaction front in a porous medium. We have analyzed the dependences of the shape and velocity of the stationary fronts with the flow rate for a flow either in the same direction than the chemical front propagation or opposite to it. We determine the structure and characteristics of the front as well as the velocity distribution measured along the front. As a result this active, chemical, tracer allows to access to the characteristic of the complex flow field of the porous medium.
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[2] J. C. Bacri, N. Rakotomalala and D. Salin. Experimental evidence of disorder effects in hydrodynamic dispersion. Phys. Rev. Lett. 58, 2035 (1987).

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