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**Spontaneous imbibition of an idealized deformable porous media** JEAN-BAPTISTE CHARPENTIER, LAURENT BIZET, ABDELGHANI SAOUAB, Univ du Havre — The spontaneous imbibition of undeformable porous media has been widely studied. The temporal evolution of the fluid front position with time generally follows Washburns law ( $x \propto t^{1/2}$ ) for a one-dimensional system. However, if a porous medium is deformable then its imbibition dynamic might be different and depends on the way it deforms. In this study the spontaneous imbibition of a system consisting of parallel flexible sheets irregularly spaced from one another is numerically investigated. Firstly, the case of a flexible sheet between two rigid walls was considered. The simulation results were analyzed in terms of imbibition duration, volume of fluid in the system and amplitude of the sheet displacements at the end of the imbibition. The influence of the boundary conditions, elasticity, dynamic contact angle, intensity of the gravity field and ratio of the sheet distance to both rigid walls were investigated. It was found that the boundary conditions greatly influence the imbibition dynamic. Secondly, some simulations were done including more parallel flexible sheets. These second series of simulations confirmed the crucial role of the boundary conditions on the imbibition dynamic and on the flexible sheets clustering.

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