



Contribution ID: 380

Type: Oral Presentation

Imbibition dynamics in cellular, xylem-like nanoporous media

Monday, 30 May 2022 17:35 (15 minutes)

We built multiscale porous media resembling the architecture of water-conducting tissues in plants (xylem), using micro/nano-fabrication techniques with silicon and glass. These structures couple a nanoporous layer to arrays of microchannels of varying aspect ratio. We studied experimentally spontaneous water imbibition in these artificial systems, in a situation where imbibition is triggered by capillary condensation from water vapor in the atmosphere surrounding the samples. We show that the presence of the microchannels can dramatically affect the dynamics of imbibition in the nanostructure, resulting in faster dynamics globally, and in intermittent dynamics locally. We further show that these effects can be tuned not only by the choice of the geometry of the microstructure, but also by changing the filling state of the cavities (air vs. vacuum), which suggests strategies for dynamic control of the speed of imbibition.

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Country

France

References

Time Block Preference

Time Block A (09:00-12:00 CET)

Participation

Online

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Session Classification: MS02

Track Classification: (MS02) Porous Media for a Green World: Water & Agriculture