#### **UiO Department of Mathematics**

University of Oslo

## A new numerical method to approximate root water uptake fluxes in a mixeddimensional setting

Timo Koch, H Wu, KA Mardal, R Helmig, and M Schneider | EGU 2021 | 29 April 2021



**UiO Department of Mathematics** University of Oslo ROOT R in mm 1.7 1.4 1.0 resolved - 0.6 interface - 0.1 SOIL **1D-3D** mixed dimension reduced methods interface 3D **3D** 

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# The problem

# Large local pressure gradients

 $\rightarrow$  inexact uptake rate



The idea

A

**Distribution** 

of source / sink

DuMu<sup>x</sup>

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# **Local (nonlinear) reconstruction** based on local analytical solution



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#### Mixed-dimension methods compared





Root collar pressure  $(p_{r,c})$  in bar





# Accurate reconstruction of interface pressure



z



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Koch et al (2020) Dumux

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https://dumux.org

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