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Type: **Poster (+) Presentation**

Representative elementary volume for Opalinus Clay from three-dimensional pore structure and transport analysis

Wednesday, 2 June 2021 10:00 (1 hour)

Understanding the transport processes in clay rocks such as Opalinus Clay (OPA) is essential for their usage as host rocks for geological disposal of high-level radioactive wastes. The sandy facies of OPA is heterogeneous and anisotropic, comprising intercalated sandy and carbonate-rich layers in the clay rock matrix. The representative elementary volume (REV) analysis can provide an enhanced understanding between macroscale and microscale properties of a multiscale porous media. This study compares the REV for both mineral components and effective diffusivities based on two- and three-dimensional images (i.a. SEM and microCT) of the sandy OPA facies. The diffusion in the microstructures across scales is simulated by the Lattice Boltzmann Method. Our results reveal that the relationship between diffusion-based REV and component-based REV is not consistent, and the diffusion-based REV is usually smaller than component-based REV, which is also proved by our through-diffusion tests of tritiated water (HTO). The classical definition of anisotropy as a rotationally dependent parameter means that the rotation of the drill hole can also change the anisotropy of the materials. Therefore, to define a rotationally invariant anisotropy, this study provides a method to find the main directions and the main diffusivities along with the main orientations of the materials.

Time Block Preference

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

References

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