Contribution ID: **674** Type: **Oral Presentation**

A neural network model with physics constraints for simulating CO2 storage in deep saline aquifers during and after injection

Monday, 13 May 2024 14:10 (15 minutes)

The exploration of CO2 capture and storage has become a crucial element in strategies aimed at mitigating climate change, where deep saline aquifers are of particular interest due to their extensive storage capacity and widespread availability. The complexities involved in effectively monitoring and simulating CO2 behavior within these geological formations present significant challenges. To address these challenges, our research introduces a specialized neural network, designed to simulate and monitor CO2 storage in deep saline aquifers during both the injection and post-injection phases. This neural network represents an integration of physics-based principles and advanced deep learning techniques. This integration facilitates the modeling of CO2's complex movement and distribution under diverse conditions. The network's ability to process and analyze spatial data, coupled with key geological characteristics, significantly enhances the accuracy of its simulations. This aspect is crucial for understanding the heterogeneous nature of subsurface systems and the dynamic behavior of CO2. The architecture of this network, encompassing various computational layers and physics-informed constraints, is designed to ensure comprehensive and precise modeling of CO2 storage processes. This approach aims to contribute to the existing body of knowledge in the field of carbon capture and storage, offering a new perspective in the simulation and understanding of CO2 behavior in subsurface systems.

Acceptance of the Terms & Conditions

Click here to agree

Student Awards

Country

Netherlands

Porous Media & Biology Focused Abstracts

This abstract is related to Porous Media & Biology

References

Conference Proceedings

I am not interested in having my paper published in the proceedings

Primary author: ZHAO, Mengjie

Co-authors: Dr WANG, Yuhang (China University of Geosciences (Wuhan)); Dr GERRITSMA, Marc (TU Delft); Prof. HAJIBEYGI, Hadi (TU Delft)

Presenter: ZHAO, Mengjie

Session Classification: MS15

Track Classification: (MS15) Machine Learning and Big Data in Porous Media