Contribution ID: **324** Type: **Oral Presentation**

Flux Regression Performances of Deep Learning in Discrete Fracture Networks

Monday, May 31, 2021 10:55 AM (15 minutes)

The need of flow and transport characterization in underground fractured media is critical in many engineering applications, like fossil fuel extraction and water resources analysis. However, there is a lack of full knowledge (geometrical and hydrogeological) of these fracture systems and, therefore, statistical representations of the fractured media are given. In this context, we perform flow simulations in underground fractures with Discrete Fracture Network (DFN) models.

The stochastic representation of the fracture systems requires thousands of DFN generations and simulations to characterize the flow in a real fractured medium. For this reason, it is desirable to consider the application of Deep Learning models and use them as alternative model reduction methods to speed up the flow characterization process.

In this work we show the application of a set of Deep Learning models for flux regression in Discrete Fracture Networks, analyzing the regression quality and revealing suitable enhancements of the already existing encouraging results [1].

Time Block Preference

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

References

[1] S. Berrone, F. Della Santa, S. Pieraccini, F. Vaccarino, "Machine Learning for Flux Regression in Discrete Fracture Networks", PORTO@iris (2019), http://hdl.handle.net/11583/2724492

Acceptance of Terms and Conditions

Click here to agree

Newsletter

Student Poster Award

Primary authors: BERRONE, Stefano (Politecnico di Torino, Italy); DELLA SANTA, Francesco (Politecnico di Torino); MASTROPIETRO, Antonio (Politecnico di Torino); PIERACCINI, Sandra; VACCARINO, Francesco

(Politecnico di Torino)

Presenter: DELLA SANTA, Francesco (Politecnico di Torino)

Session Classification: MS15

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