Contribution ID: **561** Type: **Oral Presentation**

Deep Learning Accelerated History Matching and Forecasting for Geologic CO2 Sequestration

Wednesday, 1 June 2022 11:15 (15 minutes)

Traditional physics-simulation based approaches for inverse modeling and forecasting in large-scale subsurface flow and transport problems, e.g., geologic CO2 sequestration, is a very time consuming process. In this work, we developed a deep learning assisted workflow to speed up this process. First, we developed a deep learning model to predict the pressure/saturation evolution in large-scale storage reservoir. A feature coarsening technique was applied to extract the most representative information and perform the training and prediction at the coarse scale, and further recover the resolution at the fine scale by 2D piecewise cubic interpolation. Thereafter, the feature coarsening based deep learning model was utilized as forward model in the inverse modeling process where a classical data assimilation approach, ES-MDA-GEO, was applied. The efficiency and effectiveness of the proposed deep learning assisted workflow for large-scale inverse modeling and forecasting was demonstrated with a reservoir model (~1.34 million grid cells) built upon Clastic Shelf storage site.

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Participation

Unsure

Primary authors: Dr CHEN, Bailian (Los Alamos National Laboratory); Prof. YAN, Bicheng (King Abdullah University of Science and Technology); KANG, Qinjun (Los Alamos National Laboratory); PAWAR, Rajesh (Los Alamos National Laboratort)

Presenter: Dr CHEN, Bailian (Los Alamos National Laboratory)

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