

The Blocking Moving Window algorithm. Conditioning multiple point simulations to connectivity and head data.

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Multiple point (MP hereinafter) statistical techniques have gained steam during the last five years. They allow simulating connectivity features (i.e., channels) that cannot be characterized using traditional two point statistical techniques (e.g., those using variograms). MP techniques have been used mainly as “geology simulators” to delineate hydrofacies distributions from point in space characterizations of geology. However, little attention has been given to the conditioning to dependent variables (i.e., heads). These data sets contain important information about the large scale connectivity patterns and should be accounted for in meaningful characterizations of geological media.

This work presents a step in that direction. A novel approach coupling multiple point statistics (for generating hydrofacies distributions) with a fast flow simulator (for conditioning to dependent variables) is presented. The performance of the method is displayed using a synthetic example that mimics ground water flow to a well in a channelized geological scenario. Results show that conditioning to dependent variables and connectivity data improve dramatically the characterization of the geological scenarios.