عنوان مقاله:

Determination of optimal bandwidth in upscaling process of reservoir data using kernel function bandwidth

محل انتشار:

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خلاصه مقاله:

Upscaling based on the bandwidth of the kernel function is a flexible approach to upscale the data because the cells will be coarse-based on variability. The intensity of the coarsening of cells in this method can be controlled with bandwidth. In a smooth variability region, a large number of cells will be merged, and vice versa, they will remain fine with severe variability. Bandwidth variation can be effective in upscaling results. Therefore, determining the optimal bandwidth in this method is essential. For each bandwidth, the upscaled model has a number of upscaled blocks and an upscaling error. Obviously, higher thresholds or bandwidths cause a lower number of upscaled blocks and a higher sum of squares error (SSE). On the other hand, using the smallest bandwidth, the upscaled model will remain in a fine scale, and there will be practically no upscaling. In this work, different approaches are used to determine the optimal bandwidth or threshold for upscaling. Investigation of SSE changes, the intersection of two charts, namely SSE and the number of upscaled block charts, and the changes of SSE values versus bandwidths, are among these approaches. In this particular case, if the goal of upscaling is to minimize the upscaling error, the intersection method will obtain a better result. Conversely, if the purpose of upscaling is computational cost reduction, the SSE variation approach will be more appropriate for the threshold setting.

کلمات کلیدی:

Upscaling, Optimum threshold, SSE differential, Kernel, Bandwidth