A Parallel Algorithm For Automatic Reservoir History Matching on PC Networks

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Abstract: The paper presents a parallel algorithm for automatic reservoir history matching. Based on this algorithm, a parallel program on PC networks which are highly user-friendly and economic has been developed. The code for the forward problem using in this study was a commercial, IMEX code (CMG, Canada). The parallel program was used to identify three system parameters: permeability, porosity and relative permeability using observation data from production history. Some test cases on the reservoirs from SPE comparatives (SPE1, SPE9) have been performed. The results shown that the parameters have been identified after some interactions. The computing cost have decreased about two times with a network of three PCs for identifying permeability in the reservoir of SPE1 problem and about 3.5 times with a network of 15 PCs for identifying porosity in the reservoir of the SPE9 problem. To assess the performance of the PC network, the comparisons with hight performance computing system, IBM eServer Cluster 135 (8 node) for a simple test case have been investigated and compared. The results shown that the performance on the PC network were not much different.

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