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An upgridding technique for geocellular models, taking into account the uncertainty of reservoir parameters. (English) [Zbl 1450.86002](#)
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Summary: A technique is proposed for upgridding of a geological model, taking into account the uncertainty of reservoir parameters. A distinctive feature of this technique is that the calculation of the upscaling error is based on the solution of two-phase flow equations.

MSC:

86-10 Mathematical modeling or simulation for problems pertaining to geophysics

86A20 Potentials, prospecting

Keywords:

geological model; reservoir model; upgridding; upscaling; uncertainty of reservoir parameters

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References:

- [1] King, M. J.; Burn, K. S.; Wang, P.; Venkataramanan, M.; Alvarado, F.; Ma, X.; Datta-Gupta, A., Optimal coarsening of 3D reservoir models for flow simulation, *SPE Reserv. Eval. Eng.*, 9, 317-334 (2006) · [doi:10.2118/95759-PA](#)
- [2] S. A. Hosseini and M. Kelkar, "Analytical upgridding method to preserve dynamic flow behaviour," in Proceedings of the SPE Annual Technical Conference and Exhibition, Denver, Colorado, Sept. 21-24, 2008, Paper SPE 116113. <https://doi.org/10.2118/116113-PA>
- [3] Rodionov, S. P.; Sokolyuk, L. N.; Rychkov, I. V., Upgridding methods in reservoir modelling, *Math. Models Comput. Simul.*, 5, 7-16 (2013) · [doi:10.1134/S2070048213010092](#)
- [4] Rodionov, S. P.; Sokolyuk, L. N.; Rychkov, I. V., "The analysis of computation error sensitivity at merging the layers of the geological-reservoir model," *Izv. Vyssh. Uchebn. Zaved., Neft', Gaz*, 6, 26-33 (2010)
- [5] Ya. V. Shirshov, S. P. Rodionov, O. N. Pichugin, and L. N. Sokolyuk, "Upgridding of geological models based on the equations of two-phase flow," in Proceedings of the 14th European Conference on Mathematics of Oil Recovery (ECMOR XIV), Catania, Italy, Sept. 8-11, 2014. <https://doi.org/10.3997/2214-4609.20141823>
- [6] Khalimov, E. M., Detailed geological models and three-dimensional modeling, *Pet. Geol. Theor. Appl. Studies*, 7, 1-10 (2012)
- [7] Gavris, A. S.; Kosyakov, V. P.; Botalov, A. Yu.; Pichugin, O. N.; Rodionov, S. P.; Sokolyuk, L. N.; Shirshov, Ya. V., The concept of effective design of hydrocarbon fields development. Software solutions, *Oilfield Eng.*, 11, 75-85 (2015)
- [8] Mazo, A. B.; Potashev, K. A., Upscaling relative phase permeability for superelement modeling of petroleum reservoir engineering, *Math. Models Comput. Simul.*, 9, 570-579 (2017) · [doi:10.1134/S207004821705009X](#)
- [9] D. Stern and A. G. Dawson, "A technique for generating reservoir simulation grids to preserve geologic heterogeneity," in Proceedings of the SPE Reservoir Simulation Symposium, Houston, Texas, February, 14-17, 1999, Paper SPE 51942. <https://doi.org/10.2118/51942-MS>
- [10] Rodionov, S. P.; Pichugin, O. N.; Sokolyuk, L. N.; Shirshov, Ya. V., Upgridding, upscaling and oil recovery of reservoir modeling, *Oilfield Eng.*, 11, 52-58 (2013)
- [11] Eremin, N. A., Solution of filtration problems in a porous medium by methods of fuzzy mathematics, *Oil Industry*, 4, 33-35 (1995)

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