EXPERIMENTAL CHARACTERIZATION OF FILTERING MODEL DISPLAY PROCEDURE NUMBER

Norquvvat Chunayev
Tashkent University of Information Technologies named after Muhammad al-Khorazmi, chief specialist of the Education Quality Control Department
norkuvvatchunaev@gmail.com

Bobir Shirinov
Tashkent University of Information Technologies named after Muhammad al-Khorazmi, assistant of the Department of Information Security
sh.bobur1994@gmail.com

ABSTRACT

In this paper, a near-wellbore distance uplift procedure is proposed for finite-permeability hydraulic fractures on a Voronoi network, and it is shown that fracture cells are clearly present on a coarse grid. Embedded discrete fracturemodel, it is shown that the assumption of linearity of pressure distribution in a fractured reservoir cell can lead to a significant error in solving the global problem. In this, the accuracy of solving the problem by changing the permeability of the cells was significantly analyzed.

Key words: procedure, shortened, component, porosity, hydraulic, isotropic conductivity field, hydraulic and reservoir.

Mesh construction. It is proposed to construct two coherent computing networks for solving global and local problems: a coarse network for the global problem and a fine network for local problems. Coarse and fine meshes are consistent if:

1. each coarse grid cell can be described as a union of several fine grid cells;

2. each face of a coarse mesh can be represented as a union of several fine mesh faces.

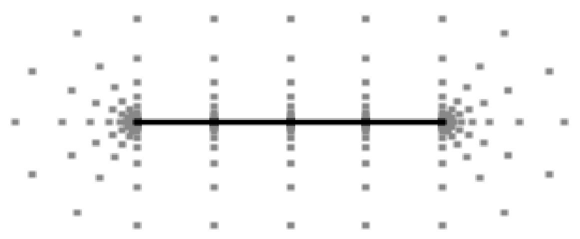
The consistency property allows accurate calculation of the values of the integrals over the cells and faces of the coarse mesh to calculate the conductivity. You can use the following algorithm to construct consistent unstructured meshes.

1. Create a mesh for the entire area Ω, where the areas close to the well are detailed with small cells, and the watery areas far from the wells are detailed with large cells. This network is called a fine grid and is used to solve local problems.

2. Construction of a new grid for the entire area based on the fine grid By combining small cells near the Ω well into large cells, the new grid is called a coarse grid and is used to solve the global problem.

In the first step, a fine mesh is constructed. In the near-wellbore region, nodal points are placed in increasing steps along the hydraulic fracture normal and radially at the fracture tips, as shown in Figure 1.1. Wells with hydraulic fractures on a fine grid are represented by a dimensional fact model (DFM). In this case, the control volumes for refraction are built on the surfaces between the water control volumes (Fig. 1.2). Fracture cells are represented geometrically as one-dimensional lines. But having a non-zero volume is calculated from the width of the fracture opening. To ensure that the total volume of the near-well area does not change, the volume of adjacent reservoir cells adjacent to the fracture is reduced accordingly, and a fine grid is constructed with fractured adjacent reservoir cells.

In the second step, a coarse mesh is constructed. The fine-mesh reservoir cells are combined into coarse meshes as shown in Figure 1.3. In this case, the crack cells will not change and will also exist in the coarse mesh. But each fracture cell is connected to only one coarse reservoir cell.



Location of nodal points for constructing a fine computational grid near a hydraulic fracture Fig. 1.1.

Node points are shown in gray. The black line indicates hydraulic fracturing.

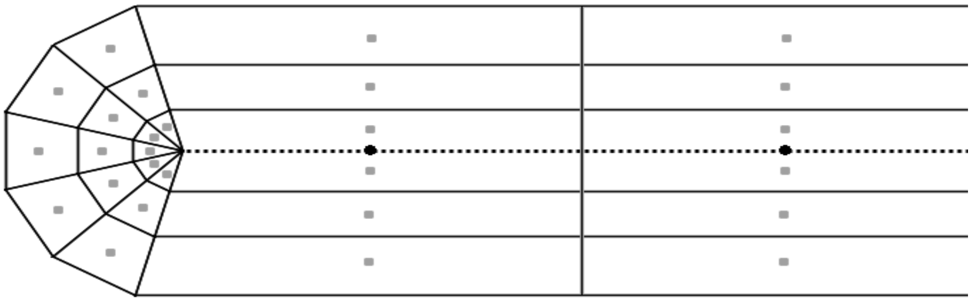


Figure 1.2.A section of a fine calculation grid near a hydraulic fracture.

Nodal reservoir cell points are shown in gray. Cell attachment points are indicated by cracks in black.

The black line indicates hydraulic fracturing, water intrusion into production wells, or oil degassing when starting new wells and is much shorter than the entire simulation period. The product of the conductance and area of the broken cells is comparable to the product of the conductance and area of the reservoir cells, so the broken cells should not have a strong negative effect on the conditionality of the system of linear equations.

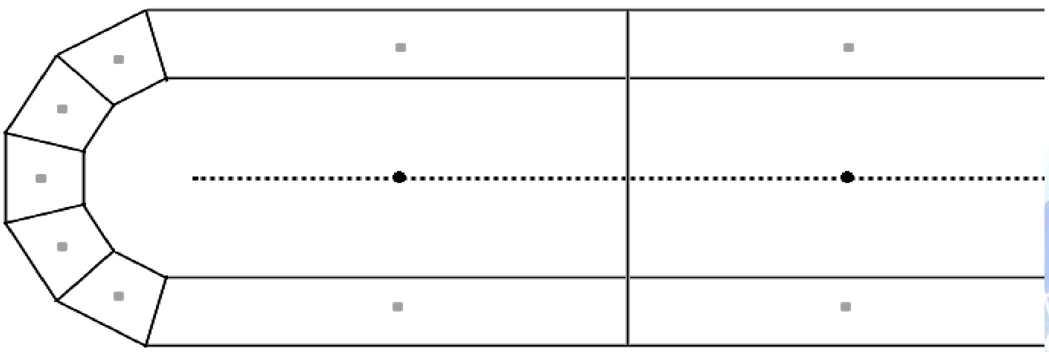


Figure 1.3. Part of a rough calculation grid near a hydraulic fracture.

All signs are similar to those in the picture. The dotted line represents only broken cells, not the line between cells. The nodal points of the rough cells through which the crack passes are geometrically compatible with the nodal points of the crack cells.

A digital experience. As an example, the problem of two-phase filtration in an inhomogeneous isotropic reservoir is considered. In the area under consideration, there are production and injection wells with hydraulic fracturing operating under constant bottom pressure. The opening width of both cracks is 1mm. The production well fracture has a permeability of 500,000 Darcy to simulate an infinite permeability, and the injection fracture has a permeability of 500 Darcy. Figure 1.6 shows the pressure obtained by solving two local problems on a fine mesh. This pressure is usedshows the conductivity calculations in order of increasing scale. It can be seen that the pressure distribution in the two local areas is different due to the different fracture permeability.

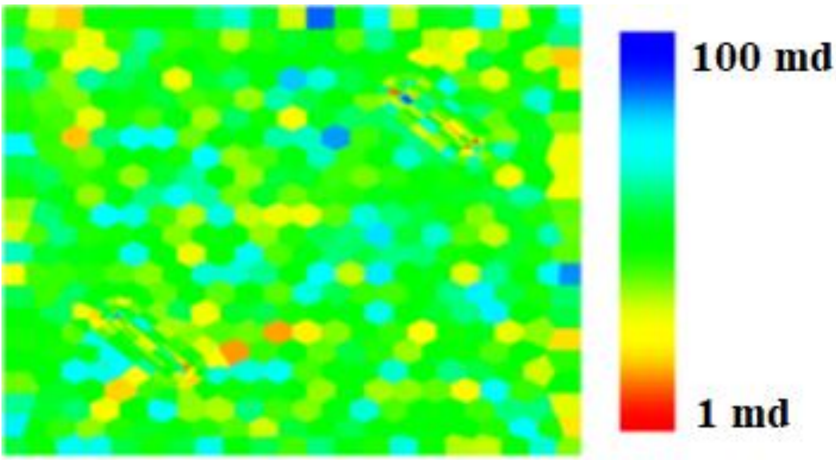


Figure 1.4. Reservoir permeability.

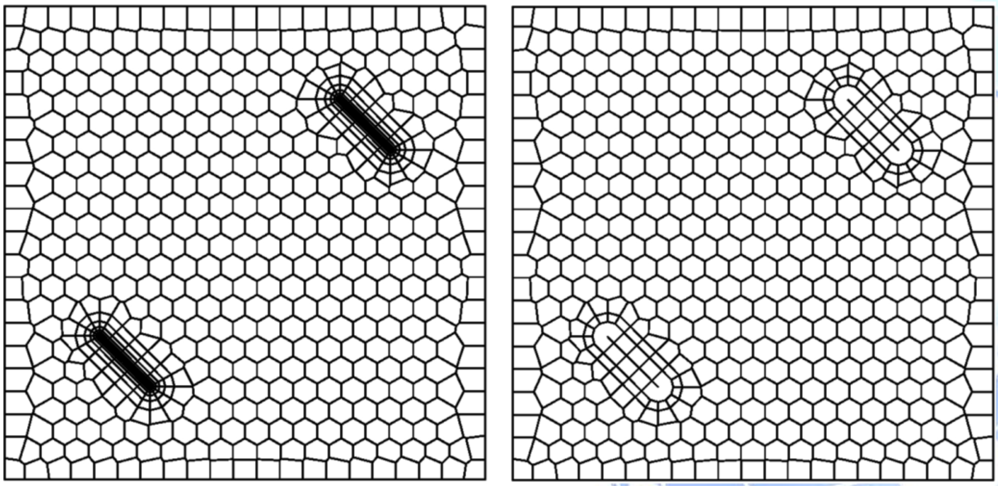


Figure 1.5 - Fine mesh (left) and coarse mesh (right).

In the lower left corner is the extraction well, and in the upper right corner is the injection well. 3 options for calculating the global problem were conducted. The first calculation is carried out on a fine grid using the classical linear formula to calculate all the conductances between cells and taken as a reference. The second calculation is performed on a coarse grid using a scaling procedure.

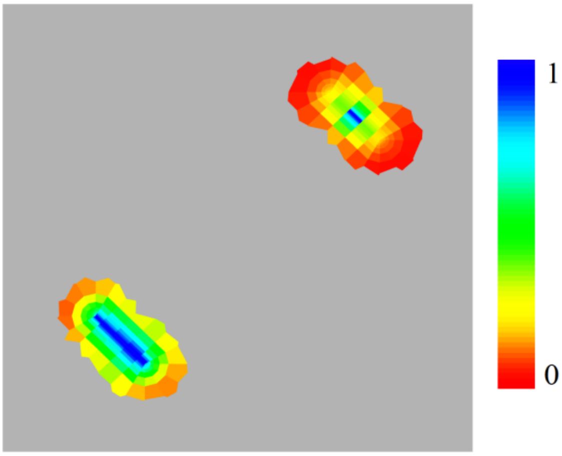


Figure 1.6. Pressure obtained by solving two local problems on a fine mesh.

The third calculation is performed on a coarse grid using the classical linear formulation and is equivalent to using an embedded discrete fracture model (EDFM). In this case, the permeability between the rough reservoir cell i and the crack cell j is calculated according to the formula.

REFERENCES:

1. Shewchuk, J. R. Delaunay refinement algorithms for triangular mesh generation / J. R. Shewchuk // Computational Geometry. – 2002. –Vol. 22, no. 1–3. – P. 21–74.

2. Хантўраев И. М., Жуманов А. Н. ЭЛЕКТР ТАРМОҚЛАРИДА ҚУВВАТ ИСРОФЛАРИНИ ҲИСОБЛАШ //Academic research in educational sciences. – 2021. – Т. 2. – №. 5. – С. 330-337.

3. Скворцов, А. В. Триангуляция Делоне и её применение / А. В. Скворцов. — Томск: Издательство Томского университета, 2002. -128с.

4. Автоматизированные технологии построения неструктурированных расчетных сеток. т.4/Ю.В.Василевский [и др.]. Москва: Физматлит, 2016. — 216 с.

5. Сиддиков И., Собиров М., Абдумаликов А., Саттаров К. (2021, ноябрь). Оборудование и программное обеспечение для мониторинга и управления процессами энергоснабжения. В 2021 году Международная конференция по информатике и коммуникационным технологиям (ICISCT) (стр. 1-6). IEEE.

6. Djuraev, A. D., Yakubkhodjaeva, M. R., Abdullaeva, M. E., & Atakhodjaeva, M. A. (2020). Synthesis And Biological Activity Of New Acetylene Ethers Of Carbamates. European Journal of Molecular & Clinical Medicine, 7(3), 3566-3582.
7. Djuraev, A. J., Yakubkhodjaeva, M. R., Abdullaeva, M. E., Atakhodjaeva, M. A., & Madikhanov, N. (2020). Synthesis Of New Acetylene-Containing Carbamate Derivatives And Their Pharmacological Activity. Solid State Technology, 63(6), 15164-15177.
8. Pardayevich, Shukurov Orziqul. "AXBOROT XAVFSIZLIGI RISKLARI TASNIFI VA BAHOLASH USULLARI." Komputer texnologiyalari 1.10 (2022).
9. Юсупов, С. Ю., Шукуров, О. П., Рўзибоев, О. Б., Шоазизова, М. Э., Сайфуллаев, Ш. Б., Мирзаев, Н., ... & Охунов, А. Р. (2019). МУҲАММАД АЛ-ХОРАЗМИЙ АВЛОДЛАРИ.
10. Раметов У., Бегжанова К. ОБ ОДНОМ ОБОБЩЕНИИ ТЕОРЕМЫ БАКСТЕРА //ВЕСТНИК КАРАКАЛПАКСКОГО ГОСУДАРСТВЕННОГО УНИВЕРСИТЕТА ИМЕНИ БЕРДАХА. – 2014. – Т. 23. – №. 2. – С. 15-18.
11. Ботирбоевна Ю. С., Янгибаевич И. Б., Озатовна С. З. Организация уроков путем создания образовательных проектов в малых группах //2021 Международная конференция по информатике и коммуникационным технологиям (ICISCT). – IEEE, 2021. – С. 1-3.
12. Сиддиков И. К., Саттаров К. А., Худжаматов К. Е. Моделирование трансформационных элементов управления источниками энергии // 2017 Международная конференция по информатике и коммуникационным технологиям (ICISCT). – IEEE, 2017. – С. 1-5.
13. Шарифовна, Курбанова Ильмира. «ЖЕЛЕЗНОДОРОЖНЫЕ НАУЧНО-ТЕХНИЧЕСКИЕ ТЕРМИНЫ И ИХ ОСОБЕННОСТИ НА РУССКОМ И АНГЛИЙСКОМ ЯЗЫКАХ».
14. Шарифовна К.И. ЖЕЛЕЗНОДОРОЖНЫЕ НАУЧНО-ТЕХНИЧЕСКИЕ ТЕРМИНЫ И ИХ ОСОБЕННОСТИ НА РУССКОМ И АНГЛИЙСКОМ ЯЗЫКАХ.