Texas Tech University - Department of Mathematics and Statistics

Seminar in Applied Mathematics

Impact of non-linearity on the optimal geometry of fractures in a reservoir

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Room: MATH 114. Time: 4:00pm.

ABSTRACT. Fluid flow in fractured reservoirs is an important topic in modern reservoir engineering. One of the most difficult aspects of the modeling and solution of this problem is the fact that the width of the fracture is several orders of magnitude smaller than the characteristic dimension of the reservoir and the length of the fracture itself.

In this talk we will present a new model of fluid flow in a fractured reservoir, which allows to treat the flow in the fracture as a specific boundary condition for the bulk of the porous medium. In the presentation we will mostly discuss mathematical details of the model reduction, and compare computational results with different geometries.

Applied aspects of the problem will also be considered, and the value of the productivity index for coupled multilateral fractures connected via horizontal wells will be reported.

This research was conducted with the supervision of Professors Eugenio Aulisa and Akif Ibragimov.