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*Characterization of Carbonate Oil Reservoirs, with Euclidean and with Fractal Geometries, using Well Tests Data*

In order to predict the production of a well , it is necessary to solve a parameter identification inverse problem. The parameters describe the characteristics of the porous media around the well.

In the case of Carbonate Media, it is important to consider triple porosity and double permeability models that have not been sufficiently studied in the past. Currently also, most of these reservoirs are studied by means of Euclidean models, which implicitly assume a uniform distribution of fractures and that all fractures are interconnected. However, there is evidence that the above assumptions are not representative of some of these systems. Fractal theory considers a nonuniform distribution of fractures and the presence of fractures at different scales; thus, it can contribute to explain the behavior of many fractured reservoirs.

In this project we work with two triple porosity and double permeability models: the first with Euclidean geometry and the second with Fractal geometry.

We will present results of sensitivity analysis to understand the effect of the parameters of both models, on the pressure. Using the sensitivity information, we identify the parameters using the Tunneling Global Optimization Method.

We will present results on synthetic and on Real Mexican Carbonate Reservoirs.