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# **Flow Barrier Detection and Characterisation using Capacitance-Resistance Model: Case Study of a Far East Oil Field**

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## **Abstract**

The Capacitance-Resistance Model (CRM) is a semi-analytical modelling approach utilizing non-linear multivariate regression. Using historical production and injection rates, as well as historical bottomhole pressure data if available, CRM quantifies the connectivity and degree of fluid storage between injectors and producers in a reservoir. The CRM has been applied to waterflood management and performance prediction, improved reservoir characterisation, waterflood optimisation and, production optimisation. In this study, the CRM was used in fault characterisation and flow barrier detection. Historical production and injection data from an oilfield from the "Far East" were then used to calibrate the CRM. Thereafter, the resulting CRM parameters were combined with geological data and wells data to characterise two major faults in the reservoir, as well as detect other flow barriers within the reservoir. Based on the results, several sections of one fault have varying degrees of communication. There were also smaller flow barriers within the reservoir section considered around this fault, that negatively impacted the performance of some injectors. The second fault was mostly sealing, with few leakages along the extent of the fault. Capacitance-Resistance Modelling can be used to corroborate the results of Interference Testing, Tracer Test and 4D Seismic in detecting and characterising faults, and as a cost-effective reservoir management tool.

**Keywords:**

[geologic modeling](#), [production control](#), [reservoir characterization](#), [machine learning](#), [log analysis](#), [enhanced recovery](#), [flow in porous media](#), [pvt measurement](#), [artificial intelligence](#), [drillstem/well testing](#)

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