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## Test of multi task XGBoost model and its application in Maokou-1 Member, east Sichuan Basin

*Monday, 30 May 2022 09:40 (1h 10m)*

The carbonate clastic shoal reservoirs in the Middle Permian Maokou Formation has been proved to be outstanding oil/ gas-generating strata. Clastical shoal reservoirs are mainly developed in Maokou-2 and Maokou-3 Members, where Maokou-1 Member is mostly wackstone and packstone. However, with the gas producing under the instructing of in-situ gas generating and enrichment theory, unconventional gas reservoirs are new targets in Maokou-1 Member. To predict porosity, permeability, TOC and lithology in Maokou-1 Member, east Sichuan basin, this study designs a new multi tasks XGBoost model and compares it with traditional random forest models and XGBoost models in single tasks. Multi task XGBoost model has four parts. The first part is inputting all well logging data and responding porosity/permeability/TOC/lithology (labels). Then all labels are encoded. After mixing-training in one shared XGBoost model, the model splits into four independent XGBoost models. Comparison shows single XGBoost models have higher accuracy than single random forest models (the best model is selected by grid search algorithm). Multi task XGBoost model reaches higher accuracy than single XGBoost models. To test multi task XGBoost model, this study collects data from YF-1 and Y66-1 (untrained) and put into multi task XGBoost model. Result shows the accuracies for lithology/porosity/permeability/TOC are 91.3%, 90.4%, 94% and 92% respectively, while for single XGBoost models, the accuracies are 72%, 81%, 77.3% and 80.8%. With multi task XGBoost, central and southeastern parts of east Sichuan Basin are the most potential zones for unconventional gas reservoirs developed based on Fuzzy Evaluation Method.

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### Country

China

### References

### Time Block Preference

Time Block A (09:00-12:00 CET)

## Participation

Unsure

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