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Improvement of lithology and saturation determined from well logging using statistical methods

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Abstract

Results of selected statistical analyses applied to well-logging data in a typical borehole in the Miocene thin-bedded formation are presented. Primary geological data in the form of lithology core descriptions was included as a joining member between logs and lithology. Principal component analysis enabled data space to be reduced. It incorporated new variables, PC, in place of logs, preserving the same petrophysical information. Clustering, discrimination and classification were tools facilitating data arrangement and preliminary data grouping according to natural petrophysical features of analysed rocks. Processing of well-logging data alone with the use of statistical methods contributed to correct evaluation of the lithology and saturation for the thin-bedded Miocene deposits. Such an approach can be advantageous for the preliminary qualitative evaluation of productive horizons.

Key words: well logging, statistical methods, Miocene deposits, Carpathian foredeep.