



Nonlinear relations between ground penetrating radar data and patterns of rock

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A new method of classification of rocks from radar data is presented in the case that no additional geological information from boreholes is available. Support vector machines and artificial neural networks have been reliable particularly for such investigations where nonlinear relationships between measured data and rock parameters exist from complex geological conditions. These nonlinear relationships conceal anomalies and are neither analytical nor numerically deducible. Starting point are models with varying physical rock parameters sought in the measured data. From the models synthetic radar signals are created, from which wave attributes are deducible. This wave attributes serve as training data for the learning algorithms to pattern recognition. The same wave attributes are extracted from the processed radar data. Thus two data sets exist for pattern recognition algorithms. For the classification, the learning algorithms back propagation neural network (BPNN) and support vector machines (SVM) were used.