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Advanced interpretation methods for GPR geological mapping based on research on valley of Zielona River and sand dune

Abstract

Ground Penetrating Radar is effective geophysical, non destructive technique used in geological mapping. Electromagnetic profiling bring information about geological structures and layer reflection times. GPR method can be successfully used for quaternary geology mapping. As an example were used surveyed profile crossed River Zielona Valley and one of next to valley sand dune of Toruń Basin. Data were collected thanks to GEOSCANNERS.PL by GPR U-Explorer manufactured by Geoscanners AB and 200 MHz ground coupled, bistatic antenna. To proper reconstruction of geological structures were used correlation between coring and geophysical data, topography correction, time-dept conversion using velocity model obtained from drilling. To improve signal quality were used average procedures, deconvolution algorithm which significantly improve resolution and clear borders between geological layers and migration which moved reflectors to proper position especially in dune structure. All mentioned procedures where compared in different options to show influence on final geological model.