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GPR survey for fir (Abies alba) and spruce (Picea abies) root systems in different location in Western Carpathians Mts. (Beskidy Mts., Poland)

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GPR survey for fir (Abies alba) and spruce (Picea abies) root systems
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The aim of the GPR research was a non-invasive inspection of the root systems arrangement of selected trees (fir Abies alba and spruce Picea abies), in the Beskid Śląski Landscaped Park and Żywiecki Landscaped Park (Carpathian Mountains, Poland). Field research has been done using RAMAC/GPR with 800 MHz shielded antennas. The survey was conducted by linear profiling to a depth of 2 m.
The survey was carried out around the designated trees in 6 meters x 6 meters grids. Base points for X (S-N) and Y (W-E) axis were set in corners of each grid. Parallel GPR traverses were conducted within each study area, at intervals of 0.20 m. The maps of research areas show GPR sections, with + 0.1 m error and the other existing trees and stumps. GPR data analysis was carried out in 2D and 3D system. The survey result in the following conclusions: 1) fir (Abies alba), has a "vertical" root system type (withthe roots dominance at depths of 0.2 – 0.8 meter), concentrically away from the tree trunk at a distance of about 1 m to about 2 m. 2) spruce (Picea abies), has a "cloud" root systems type (at a depth of 10 - 100 cm), with a few clear, thicker roots extending from the trunk.