Surveying the shallow structure of paved roads using multi-channel ground-penetrating radar

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Multi-channel ground-penetrating radar (GPR) can recently acquire a lot of data under paved roads with high density. Intervals between faces of antennas and roads require frequently some clearances to keep high scanning speed. However, the clearance makes strong multiple reflections on acquired radar records. We acquired multi-channel GPR records with GNSS measurements on a round test pavement in PWRI using GPR equipment designed with a ground coupled type. Acquired multi-channel records have little noise from multiple reflections and boundaries of underground road constructions are clearly classified. Different offsets of distance between transmitters and receivers are included in the multi-channel records and RMS velocities down to target boundaries can be estimated. NMO correction was applied for all GPR data using the estimated propagation velocities. Reflection events from boundaries of road formation are clearly identified in a depth slice section.

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