Matching locations of survey lines and common reflection points between multi-channel GPR records

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Recent multi-channel ground-penetrating radar (GPR) provides high volume of survey data in short time. Also, high accurate GNSS measurement can be easily used and the combination of GPR and GNSS provides many repeated records in the similar locations. However, repeatedly acquired GPR records cannot be acquired at the exactly same locations and must be surveyed at the slightly different locations. Positioning accuracy of RTK-GNSS is not enough to set survey locations or detect relative survey positions with between two different surveys. On the other hand, repeatedly scanned survey records using multi-channel GPR in a similar survey line have large potential to improve the signal to noise ratios of survey records and detect underground events. Matching locations of survey lines and common reflection points between repeatedly surveyed multi-channel GPR records becomes an important technique for future GPR processing. We will discuss methods of matching two or more different survey records of multi-channel GPR and show results matched with relative positions of records which are actually acquired on paved roads. A set of multi-scanned survey records has high dense information for space and many CMP records which can be useful for making a velocity distribution map.

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