BLIND TEST OF METHODS FOR OBTAINING VELOCITY MODELS FROM FIRST-ARRIVAL TRAVEL TIMES USING REFRACTION TOMOGRAPHY METHODS

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The possibility to apply different approaches to first-arrival time analysis of seismic data was examined using a sample synthetic first-arrival data set calculated from an unknown velocity model. This model was intentionally created for the purposes of a blind test and it was designed to represent a realistic near-surface target. Using the provided synthetic first-arrival data set various velocity models were estimated. The variety of models was acquired based on the understanding of the wide range of possible solution that can exist when dealing with the inverse refraction-traveltime problem (IRTP). Solutions to the IRTP were obtained using the refraction-tomography inversion technique. The variety of different solutions was provided by using different initial models and regularization parameters. Efforts were applied to obtain realistic appearing solutions that are noticeably different from one another. The estimated velocity models will be compared with the synthetic velocity model when it becomes available. Such a comparison is expected to provide evidence about the possible degrees of nonuniqueness of the IRTP for this particular model.