



Wide angle reflection effects on the uncertainty in layered models travel times tomography

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Multi-phase layered model traveltimes inversions can be realised in several ways depending on the inversion path. Inverting the shape of the boundaries based on reflection data and the velocity field based on refractions could be done jointly or sequentially. We analyse an optimal inversion path based on the uncertainty analysis of the final models. Additionally, we propose to use post critical wide-angle reflections in tomographic inversions for more reliable results especially in the deeper parts of each layer. We focus on the effects of using hard to pick post critical reflections on the final model uncertainty.

Our study is performed using data collected during standard vibroseis and explosive sources seismic reflection experiment focused on shale gas reservoir characterisation realised by Polish Oil and Gas Company. Our data were gathered by a standalone single component stations deployed along the whole length of the 20 km long profile, resulting in significantly longer offsets. Our piggy back recordings resulted in good quality wide angle refraction and reflection recordings clearly observable up to the offsets of 12 km.