

Estimation of underground basin structures for strong motionsimulation using joint inversion of refraction and gravity data

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Modeling of underground structures is one of important tasks for strong motion simulation. Seismic surveys can give precise estimate of velocities, but they are too expensive to cover the whole area of a sedimentary basin. Beside that, the inversion of refraction traveltime data sometimes encounters the ray coverage problem. To overcome this problem, we propose a joint inversion of refraction and gravity data since gravity surveys are carried out densely and homogeneously. Model regularization is used to avoid oscillatory artifacts in the solution and to minimize the non-uniqueness of the solution. The validity of the formulation is verified using synthetic data for a valley-like basin with pseudo-random noise. This method is applied to the Kanto basin data for two-layer and lateral heterogeneous basement velocity model. Our result show more complex pattern than previous results. We also make strong motion simulation using this inversion result.