

# 3D hybrid structure modeling method with locally detailed model and spline function model

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This paper presents a hybrid technique for modeling sedimentary basin structure that combines smooth spline function model with locally detailed model. The advantage of this technique is an accurate modeling in a region with high density data where sharp changes of basin edge structure are expected. We successfully applied this technique to the Osaka basin structure using the detailed exploration model in Kobe area and previously proposed Osaka spline model. The Kobe area model was constructed from results of seismic reflection surveys, deep drillings and microtremor array observations using the Kriging method. Kriging is a very flexible gridding method that produces accurate grids from given data set. Proposed hybrid model, as well as the original Osaka basin model has four-layered structure. We evaluated parameters of the new Osaka 3D sedimentary basin hybrid model through numerical simulations of two small earthquake records by 3D-FD method. We found that we can simulate the direct S-wave and properties of the surface wave propagation in the Kobe area (in frequency range less than 1.0Hz) using hybrid model better than the previous model. Calculated wave forms do not change remarkably outside the hybrid area.

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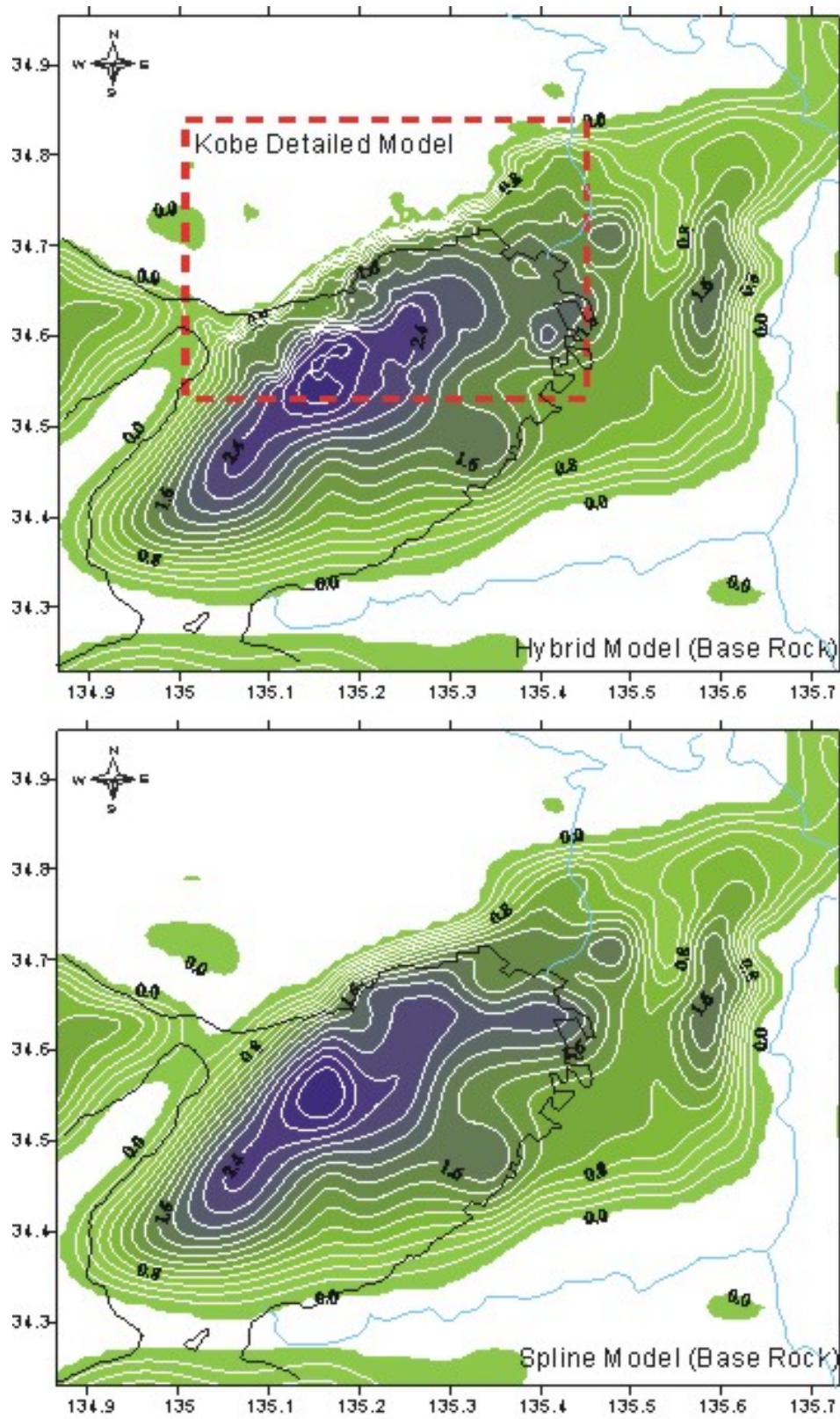


Fig.1 Comparison between the Hybrid model and spline model.