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# Deformation simulations by the discrete element method controlling basement motions by the dislocation solutions

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In previous studies on deformation of sedimentary layer due to fault motions within the basement by means of the discrete element modeling, the basement has been treated as rigid body. In this study, we attempted to control motions of the basement by dislocation analytical solutions based on the elasticity in order to discuss the deformation field of the sedimentary layer in connection with fault parameters.

As a result, we found tilt of deformed sedimentary layer which did not appear in the rigid basement model. And, shapes of deformed sedimentary layer around the fault tip were different from rigid basement model, and even in the elastic basement model it was shown that their shapes will be varied by the fault parameters selected in the modeling.

Since sedimentary layers deform by following to shape of deformed basement, and the basement controlled by the dislocation analytical solutions deforms by the fault parameters, it was shown that not only shape of deformed sedimentary layers but trishear and its propagation processes will be able to be discussed in connection with the fault parameters. In the future, we will accumulate some know-how on practical analyses method by applying our modeling procedure to interpretations of topography, geological structures and seismic survey data, and we would like to hasten quantitative discussions on tectonics and/or forming processes of geological structures.

Keywords: Discrete Element Method, Dislocation analytical solutions, Displacement of sedimantary layer, PFC