

## Revisit of the mechanism of the postseismic deformation associated with the 1993 Hokkaido Nansei-Oki earthquake, Part 2.

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We examined the source mechanism of the postseismic deformation associated with the 1993 Mw7.7 Hokkaido Nansei-Oki earthquake, northern Japan. Ueda et al. (2003) first noted the postseismic deformation and concluded that viscoelastic relaxation in the upper mantle is a main source. However, leveling data which were collected recently and a transient change of horizontal GPS following the earthquake cannot be explained by Ueda et al. (2003)'s model. We compared the deformation observed by GPS and leveling with that predicted by three possible mechanisms for postseismic deformation (e.g. afterslip, viscoelastic relaxation, and poroelastic rebound). None of them alone can fit the data adequately. Our preferred model is a combination of afterslip on the downdip extensions of the coseismic faults and viscoelastic relaxation in the upper mantle. The preferred viscoelastic structure consists of a 30 km-thick viscoelastic layer with a viscosity of  $2 \times 10^{18}$  Pa·s sandwiched between a 40 km-thick elastic plate and a viscoelastic half-space with a viscosity of  $8 \times 10^{19}$  Pa·s.