Inhomogeneous structure in and around the focal area of the 2004 Niigata-Chuetsu earthquake imaged by coda envelope inversion

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Three-dimensional distribution of scattering coefficients is estimated from an envelope inversion of aftershock data of the 2004 Niigata-Chuetsu earthquake in order to investigate the short-wavelength inhomogeneous structure that cannot be imaged by conventional travel-time tomography. Obtained results show large scattering coefficient zones (LSZs) along and around the focal area of the 2004 Niigata-Chuetsu earthquake. Scattering coefficients of the LSZs are especially large in the northern part of the focal area where a complex distribution of aftershocks is shown. Such a distribution of aftershocks and LSZs may suggests relationship between causative faults distribution of aftershocks and short-wavelength inhomogeneous structure. On the contrary, an anomalous zone with small scattering coefficient is detected below the Echigo Mountains to the east of the focal area. This small scattering coefficient zone may be related to the distribution of basement rocks without aftershock faults.