Characteristics of group velocity of Love waves across a large scale dent in the continental crust

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Group velocities of Love waves are measured axross a dent in the continental crust that has a maximum thickness of 50-85 km and a horizontal scale of 250-2000 km. Group velocities over the entire width of the crustal dent structure are lower than those for the stratified medium with a maximum crustal thickness of the dent at short periods of 20-30 s.

The dispersion characteristics of group velocity of Love waves were measured across a dent in the continental crust that has a maximum thickness of 50-85 km and a horizontal scale of 250-2000 km. The numerical modeling analyses are performed using the finite difference method. The group velocities over the entire width of the crustal dent structure are lower than those for the stratified medium with a maximum crustal thickness of the dent at short periods of 20-30s. The period range becomes longer as the sloping angle of the dent increases or the crustal thickness of the dent increases. The period indicating a group velocity minimum for the crustal dent structure is shorter than that for the stratified medium with a maximum crustal thickness of thedent.
   The detailed results of numerical analyses for large scale mountain root models are as follows: 1) the group velocities for path lengths of 2000 km (V2000) and 1800 km (V1800) are similar to those for a path length of 250 km (Model E) for periods of 20-50 s.2) V2000 and V1800 are slightly higher and lower than the group velocities for Model E at periods shorter and longer than 35 s, respectively. 3) V2000 and V1800 are lower than U2 at short periods (U2: the group velocity for the stratified medium with a maximum crustal thickness of H2 (=87.5 km) for Model E.The periods indicating a group velocity minimum for the dent structures are shorter than that for the stratified medium. The boundary of the crustal dent in the transverse direction , in 3-D structures, is assumed to be located at a distance of 250 km from the great circle. The width (2w =500 km) of the crustal dent is the size comparable to the scale of the Tibetan Plateau in the north-south direction. The dispersion relations

obtained from 3-D structures for path lengths of 1500, 1000, and 750 km are as follows: 4) the group velocities at periods of 20-35 s are greatly lowered, probably owing to the effects of scattering and diffraction in 3-D crustal dent. 5) the dispersion relations for 3-D structures approach those for 2-D structures with an increase in path length.