Attenuation and dispersion of SH waves due to scattering by 2-D cavities

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We simulated SH waves that pass through media with random distribution of 2-D circular or elliptic cavities, using a boundary integral equation method. We then measured the attenuation and dispersion of the primary waves due to scattering. They were shown to agree well with theoretical prediction based on a single scattering theory. Considering similar results that were formerly obtained for attenuation and dispersion due to scattering by 2-D cracks, it is suggested that the theory holds independently of the shapes of scatterers.

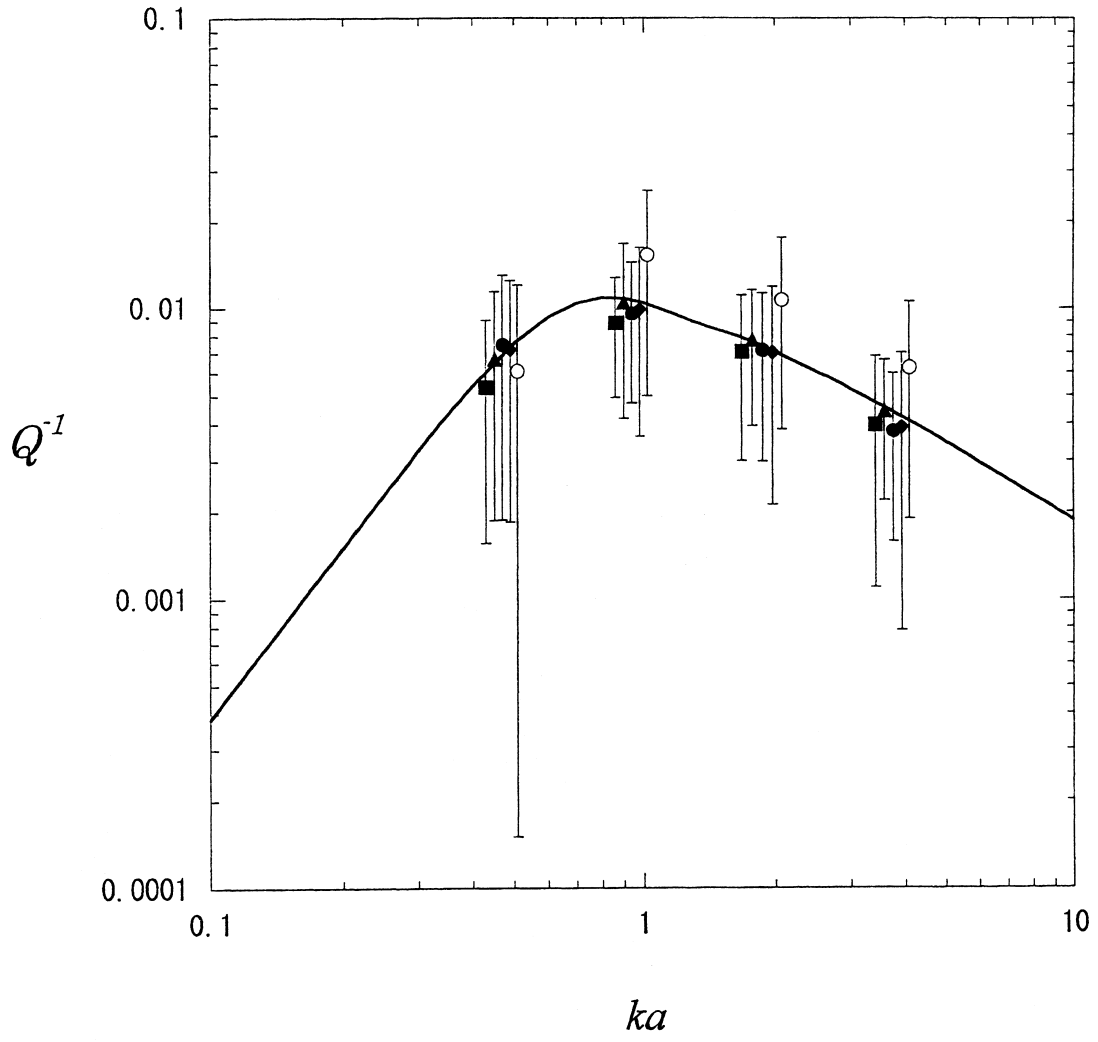

Figure. The dependence on ka of the scattering attenuation Q^{-1} due to randomly distributed circular cavities, where k is the wavenumber and a is the radius of cavities. Here $va^2 = 0.0052$ is assumed, where v is the number density of cavities. Each symbol denotes the mean value of Q^{-1} obtained from synthetic seismograms, that were computed for a specific cavity distribution. The solid symbols denote the present results and the open circles do those of Benites *et al.* (1992). To distinguish them easily, all the symbols but the solid circles are offset either to the right or left of the original locations. The bars indicate the standard deviations. Theoretical prediction by Kawahara and Yamashita (1992) is shown by a solid curve.