Garcia-Molina, Guinea, and Louis Reply: We agree with the previous Comments[1-3] that the problem of elastic percolation with nearest-neighbor central forces is of geometrical nature only, and that there is a sharp discontinuity at $k_b = 0$ (in the notation of Ref. 4) or, equivalently, $\mu = 0$. We have identified a feature of our numerical procedure which has influenced our finite-size scaling results and led us to incorrect conclusions. The point concerns the $\sqrt{3}\times\sqrt{3}$ reconstruction of the triangular lattice used in our work. When choosing finite samples of these lattices, care should be taken to preserve the global hexagonal symmetry of the system in such a way that no shear stresses are induced by isotropic boundary conditions (hydrostatic pressure). This precaution was not taken in Ref. 4, and we believe that it was the origin of the results reported there, rather than the accuracy of the numerical methods. We have repeated the finite-size scaling analysis with hexagons whose centers lie at nodes built of identical bonds (see Fig. 1 of Ref. 4) and sides 12, 24, and 48 (in units of the bond length). This choice guarantees that only isotropic stresses are induced as a response to an isotropic strain at the boundary. Preliminary results for $\lambda \neq \mu$ indicate that the value of p_{c_e} is the one found for $\lambda = \mu$ by Lemieux, Breton, and Tremblay[5]; for instance, we have obtained $p_{c_e} \approx 0.63$ for $k_a/k_b = 20$.

The constancy of p_{c_e} can also be illustrated by looking at the behavior of the bulk modulus B as a function of p and the ratio k_a/k_b for large samples. Our results, for hexagons of side 48 and two largely different values of k_a/k_b, are shown in Fig. 1. We note that B tends to zero at a value of p which is independent of k_a/k_b. Although previous experience[2,6] indicates that there are unexpected difficulties when trying to extrapolate the behavior of small samples to the limit of infinite size, the results shown in Fig. 1 are very illustrative. In the figure we also plot the straight lines obtained within the noninteracting-void approximation described in Ref. 4, namely,

$$B = B_0\left[1 - \frac{\lambda+2\mu}{\mu}(1-p)\right]. \qquad (1)$$

Note that this equation gives the correct slope at $p = 1$, also given by other effective-medium theories.[7] It is worth remarking that the actual behavior of B is very well approximated by this equation when $\lambda = \mu$, up to very near the percolation transition. When λ/μ is increased,[8] spatial correlations seem to become more important, and the two curves deviate appreciably, even far from p_{c_e}. We think that further investigation of these deviations may provide useful information on the behavior of the percolation network when λ/μ is varied.

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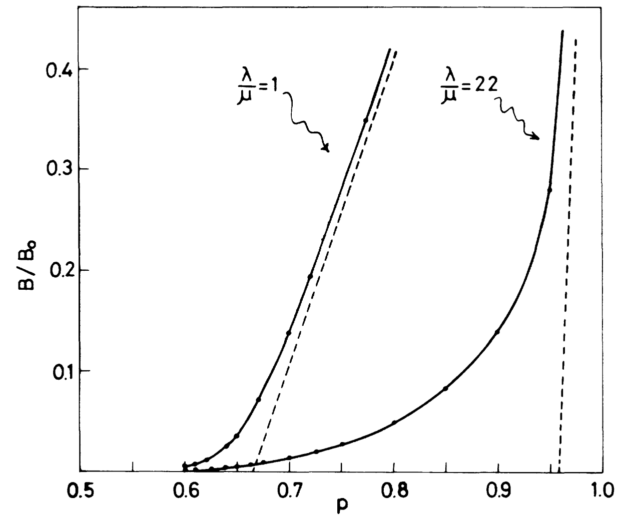

FIG. 1. Normalized bulk modulus as a function of p. Solid lines represent the result of our numerical simulations for a hexagon of side 48 and dashed lines correspond to the approximation given by Eq. (1). Two different values of k_a/k_b, 1 and 50, are represented.

R. Garcia-Molina and F. Guinea
Instituto de Ciencia de Materiales
Consejo Superior de Investigaciones Científicas
Universidad Autónoma
28049 Madrid, Spain

E. Louis
Departamento di Física Aplicada
Universidad de Alicante
Apartado 99
03080 Alicante, Spain

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