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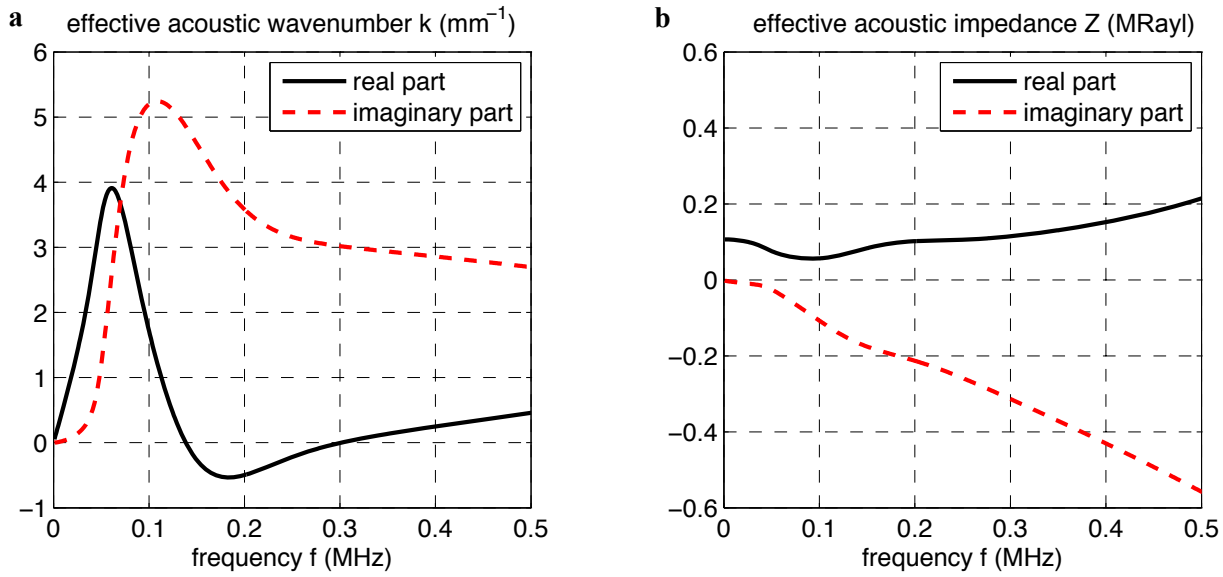

Figure S2 Predictions of the real and imaginary parts of the effective acoustic properties of our metafluid sample. (**a**) The complex-valued effective acoustic wavenumber k and (**b**) the effective acoustic impedance Z were determined using Eqs. S2-S4, and the material parameters were obtained through direct-contact measurements performed on large soft silicon rubber monoliths and on the pure water-based gel matrix. The mean radius $<a>$ was 160 μm, and the size dispersion was 25%. The volume fraction Φ_0 was 20%.

Calculations of the effective mechanical constitutive parameters:

From Eqs. S3 and the measured material parameters, we also determined the real and imaginary parts of both the effective mass density ρ and the effective bulk modulus B for our metafluid sample, as shown in Figs. S3. Although the real part of the effective wavenumber k (or the effective acoustic index $n = k/k_0$) is negative near 200 kHz (Fig. S2a), the model predicts that the real part of the mass density ρ is positive (Fig. S3a), whereas that of the bulk modulus B is negative (Fig. S3b). Therefore, the term "double-negative metamaterials" may be inappropriate to refer to such dissipative metamaterials, as explained by Dubois *et al.*[6]

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