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Intermediate response of complex fluids with biophysical implications HAIM DIAMANT, Tel Aviv University — Over sufficiently large distances any complex fluid responds as a continuous medium, characterized by bulk viscoelastic moduli. But how large is "sufficiently large"? Close examination of the competing sub-asymptotic term reveals a distinctive spatio-temporal regime, intermediate between the small-scale and large-scale responses. In materials such as semiflexible polymer networks this regime governs the dynamics over a broad range of distances, pushing the crossover to the bulk behavior to a distance much larger than the structural correlation length. The validity of these findings has been confirmed by two-point microrheology of entangled F-actin networks, where the crossover distance was found to be of micron scale — i.e., relevant to biological cells.[1] We discuss consequences of the intermediate response for the fluctuations of small objects and membranes inside actin networks.

[1] A. Sonn-Segev, A. Bernheim-Groswasser, H. Diamant, Y. Roichman, Phys. Rev. Lett. **112**, 088301 (2014).

Haim Diamant
Tel Aviv Univ

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