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**Light propagation in random colloidal films with varying coordination number** XIAOTAO PENG, ANTHONY DINSMORE, University of Massachusetts, Amherst — We measure the propagation of light through a random film of strongly-scattering microspheres as a function of the mean number of contacts per particle (the coordination number,  $Z$ ). Decreasing  $Z$  reduces the local average refractive index and enhances the optical contrast of each scattering sphere with the effective background. In our experiments, we mix two kinds of colloidal spheres and prepare a dried film with random structure. Latex spheres coated with a high-index ZnS and poly(methylmethacrylate) spheres are used, as well as SnS<sub>2</sub> core-shell spheres for the near infrared. The transport mean-free path is then extracted from measurements of coherent backscattering of light from the films; its value is sensitive to  $Z$ . The results may guide our understanding of the propagation of waves in random media in general and may lead to new photonic materials. This work is supported by the NSF-sponsored UMass MRSEC. A.D.D. is a Cottrell Scholar of the Research Corporation.

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