Abstract Submitted
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Mode Statistics in Random Media[1] JING WANG, AZRIEL GENACK, Department of Physics, Queens College, The City University of New York — The nature of transport through a material is determined by the spectrum of modes or energy levels. We have analyzed the frequency variation of the transmitted microwave field speckle pattern for quasi one-dimensional random samples to obtain the central frequencies, linewidths and speckle patterns of the modes for an ensemble of samples at lengths of two and three times the localization length. The number of modes can be determined unambiguously from the spectrum of the goodness of fit. From these results we obtain the statistics of mode spacings and widths. The distribution of spacings between adjacent modes is close to the Wigner surmise predicted for diffusive waves exhibiting strong level repulsion. However, deviations from the Wigner surmise can be seen in the distribution of spacings beyond nearest modes. A weakening in the rigidity of the modal spectrum is observed as the sample length increases because of reduced level repulsion for more strongly localized waves. In contrast to residual diffusive behavior for level spacing statistics, the distribution of level widths are log-normal as predicted for localized waves.

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