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Universal Statistics of the Scattering Coefficient of Chaotic Microwave Cavities.[1] SAMEER HEMMADY, XING ZHENG, THOMAS ANTONSEN, EDWARD OTT, STEVEN ANLAGE, Dept. of Physics. University of Maryland- College Park. — We experimentally investigate theoretical statistical predictions [X.Zheng, *et al.* cond-mat/0408327] for the universal scattering coefficient in wave chaotic systems using a microwave analog of a quantum chaotic infinite square well potential [S. Hemmady, *et al.* submitted to Phys.Rev.E]. We consider the statistics of the scattering coefficient S of a two-dimensional chaotic microwave cavity coupled to a single port. The non-universal effects of the coupling in the experimental S data are removed using the radiation impedance of the port, obtained directly from the experiments [S. Hemmady, *et al.* Submitted to Phys. Rev. Lett., cond-mat/0403225]. A normalized scattering coefficient is obtained, and its Probability Density Function (PDF) is predicted to be universal in that it depends only on the loss (quality factor) of the cavity. We compare experimental PDFs of the normalized scattering coefficients for different degrees of quantified loss with those obtained from Random Matrix Theory (RMT), and find excellent agreement. We will discuss how these results apply to scattering measurements on other quantum chaotic systems including those with broken Time Reversal Symmetry.

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