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Wave decay rates and resonances in dimension two

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Abstract. Resonances are generalizations of eigenvalues used in settings where some or all of the spectrum is continuous rather than discrete. An example of such a setting is a wave in the exterior of a compact obstacle. The decay rates of such a wave correspond to imaginary parts of resonances. But the correspondence is more complicated in dimension two than in dimension three due to the fact that the Huygens principle only holds in a weakened form: a free 2d wave caused by a sudden localized disturbance decays locally only polynomially, while in 3d it locally vanishes away to nothing in finite time. This leads to a richer structure of resonances at zero in dimension two. In this talk, which is based on joint work with Tanya Christiansen, I will describe the different kinds of resonances at zero and their corresponding wave decay rates.