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On the isolated spectrum of the Perron-Frobenius operator. (English summary)
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37C30 (37A25 37A30 37E05)

The Perron-Frobenius operator P describes the dynamics of densities under the action of a given dynamical system (i.e. a pair consisting of a map T and a compact phase space X on which it acts). The paper discusses the case when $X = [0,1]$ and the map is piecewise C^2. Restricting the action of the linear operator P to a suitable Banach space, one can study its spectrum. The focus of the paper is on the properties of isolated eigenvalues (often called Ruelle resonances) of P, considered as an operator acting in the space of functions of bounded variation. According to general results by M. Blank and G. Keller [Nonlinearity **11** (1998), no. 5, 1351–1364; MR1644405 (99h:58145)], if the map T does not have periodic turning points (points where the derivative of T is not well defined) the corresponding isolated eigenvalues are stable under a broad class of small random or deterministic perturbations. The paper describes in detail dependence of isolated eigenvalues on the parameter a of a certain family T_a of one-dimensional piecewise linear expanding maps (this parameter controls slopes of some one-to-one branches of the map T_a) and demonstrates (mainly by means of Ulam Markov chain approximation techniques) various bifurcations when the parameter a varies.

Reviewed by *M. L. Blank*

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Note: This list reflects references listed in the original paper as accurately as possible with no attempt to correct errors.

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