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Finite dimensional approximations of the Frobenius-Perron operator for piecewise convex maps with countable number of branches

Fixed points of the Frobenius-Perron operator of a dynamical system are stationary densities of invariant measures of the system. However, the Frobenius-Perron equation is a functional equation and it is difficult to solve. Using Ulam's method one can find finite dimensional approximations (Ulam's matrices) of the Frobenius-Perron operator. Ulam's matrices are stochastic matrices and their fixed points are approximations of the unique stationary density function of the system. In this talk, we consider a class of piecewise convex maps with countably infinite number of branches which possesses a unique stationary density f^* of an invariant measure. We develop an Ulam method for approximation of f^*. Convergence analysis is presented. We provide examples with errors between f^* and approximate stationary densities via Ulam's method.