RUELLE'S PERRON-FROBENIUS THEOREM AND THE CENTRAL LIMIT THEOREM

FOR ADDITIVE FUNCTIONALS OF ONE-DIMENSIONAL GIBBS STATES

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A central limit theorem for a class of stationary sequences is given. The proof is based on the spectral analysis of an associated Perron-Frobenius type operator.

1. Introduction.

The central limit problem for sums of stationary sequences has such a long history (dating back to Markov and Bernstein, at least) that one might have hoped the final chapter had by now been written. Alas, this is not the case.

It is now known that the central limit theorem will generally hold for a stationary sequence when there is a certain degree of "mixing" present. A variety of general results specifying sufficient conditions for the validity of the central limit theorem are presented in the treatise by Ibragimov and Linnik (1971), and further references to the literature are made there. So far as I have been able to discern, there are four methods for obtaining such results: (i) Markov's method of moments; (ii) Bernstein's method of approximation by i.i.d. sequences; (iii) Doeblin's method of finding "regeneration times"; and (iv) a martingale method which is apparently due to Gordin (1969). Although these methods are very powerful, enabling one to work with very general

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