Universal gap growth for Lyapunov exponents of perturbed matrix products

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Abstract: We present recent results on quantitative simplicity of the Lyapunov spectrum of d-dimensional bounded matrix cocycles subjected to additive random perturbations. In dimensions 2 and 3, we establish explicit lower bounds on the gaps between consecutive Lyapunov exponents of the perturbed cocycle, depending only on the scale of the perturbation. In arbitrary dimensions, we show existence of a universal lower bound on these gaps. A novelty of this work is that the bounds provided are uniform over all choices of the original sequence of matrices, making no stationarity assumptions. Hence, our results apply to random and sequential dynamical systems alike. This is joint work with Jason Atnip, Gary Froyland and Anthony Quas.