Statistical properties for holomorphic endomorphisms of projective spaces

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Consider a generic non-invertible holomorphic endomorphism f of a complex projective space P^k. We introduce various invariant functional spaces, including a dynamical Sobolev space, on which the action of f admits a spectral gap. This is one of the most desired properties in dynamics. It allows us to obtain a list of statistical properties of f such as the equidistribution of points, speed of convergence, K-mixing, mixing of all orders, exponential mixing, central limit theorem, Berry-Esseen theorem, local central limit theorem, almost sure invariant principle, law of iterated logarithms, almost sure central limit theorem and the large deviation principle. Our results hold for a large class of invariant measures including the measure of maximal entropy. Most of the results are new even in dimension 1. Our construction of the invariant functional spaces uses ideas from pluripotential theory and interpolation between Banach spaces. This is a joint work with Fabrizio Bianchi.