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Title: Nice inducing schemes and the thermodynamics of rational maps

Abstract:

We consider the thermodynamic formalism of a complex rational map \$f\$ of degree at least 2, viewed as a dynamical system acting on the Riemann sphere. More precisely, for a real parameter \$t\$ we study the (non-)existence of equilibrium states of \$f\$ for the potential \$-t \ln If'I\$, and the analytic dependence on \$t\$ of the corresponding pressure function. The main difficulty is that, for \$t \neq 0\$, these potentials are unbounded.

We give a fairly complete description of the thermodynamic formalism of a rational map that is "expanding away of critical points" and that has arbitrarily small "nice couples". In particular our results apply to infinitely renormalizable quadratic polynomials with a priori bounds, non-renonrmalizable polynomials, topological ~Collet-Eckmann rational maps, and backward contracting rational maps. This is a joint work with Feliks Przytycki.