
GUUS REGTS, University of Amsterdam

Nonvanishing domains of the independence polynomial

Sokal conjectured about 15 years ago that there exists an open region D in the complex plane that contains the interval $[0, \lambda_\Delta)$ for some constant $\lambda_\Delta > 0$ such that the independence polynomial of any graph of maximum degree at most Δ does not vanish on D . In joint work with Han Peters we have settled this conjecture using complex dynamical systems. In this talk I will explain the connection between zeros of the independence polynomial and complex dynamical systems and give some ideas of our proof of this result. I will also explain how, based on a recent line of work initiated by Barvinok, this result gives an efficient algorithm for approximating evaluations of the independence polynomial on D .