

# Volume growth and spectra of Dirichlet forms

M. Keller

In Riemannian geometry the exponential volume growth yields an upper bound from the bottom of the essential spectrum. In contrast, there are graphs of polynomial growth that already have positive bottom of the essential spectrum, if the volume is measured with respect to the natural graph distance. This disparity can be resolved in the common framework of regular Dirichlet forms. There, one has a concept of intrinsic metrics. If the volume is measured with such an intrinsic metric, then the classical result can be achieved in great generality. Moreover, for graphs one can relate the natural graph distance to a special intrinsic metric. In this way one finds that the threshold for positive bottom of the essential spectrum lies at cubic growth with respect to the natural graph distance.

This is joint work with Sebastian Haeseler and Radoslaw Wojciechowski.