

1011-05-156

Sebastian M Cioabă* (sebi@mast.queensu.ca), Department of Mathematics, Queen's University, Kingston, Ontario K7L 3N6, Canada. *Perfect matchings, eigenvalues and expansion*. Preliminary report.

We describe a simple procedure of obtaining new expanders from old. This involves adding or removing perfect matchings from good expanders. In particular, given $\epsilon > 0$, we show how to construct d -regular graphs with nontrivial eigenvalues less than $(2+\epsilon)\sqrt{d-1}$ for almost all d . This part is joint work with Ram Murty. We also discuss eigenvalue conditions that imply the existence of perfect matchings in regular graphs and improve a recent result of Brouwer and Haemers. (Received August 24, 2005)