

1116-05-2290

Yoshiharu Kohayakawa* (yoshi@ime.usp.br), Instituto de Matemática e Estatística, Universidade de São Paulo, São Paulo, SP 05508-090, Brazil. *The regularity method and blow-up lemmas for sparse graphs.*

The combined application of Szemerédi's regularity lemma and an embedding lemma (or a subgraph counting lemma) is now often called the *regularity method*. In its simplest form, the regularity method allows one to investigate the existence of a given fixed graph as a subgraph of a large graph. Komlós, Sárközy and Szemerédi strengthened the regularity method by developing the *blow-up lemma*, which, combined with the regularity lemma, allows one to address problems in which the subgraphs being sought are large, for instance, when they are spanning subgraphs (e.g., the k th power of a Hamilton cycle).

Owing to the work of several researchers, including Balogh, Conlon, Fox, Gowers, Morris, Rödl, Samotij, Saxton, Schacht, Thomason, and Zhao, the regularity method has also been successfully strengthened to handle graphs with a subquadratic number of edges, that is, one now knows well how to apply this method in the sparse setting when one investigates the existence of *small subgraphs*.

In this talk, we shall discuss blow-up lemmas in the sparse setting, currently under development in collaboration with P. Allen, J. Böttcher, H. Hàn and Y. Person. (Received September 22, 2015)