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Gregory L. Cherlin*, 110 Frelinghuysen Rd., Piscataway, NJ 08854. *Universal graphs with forbidden subgraphs*. Preliminary report.

The problem under consideration is the existence of a countable universal graph within the collection of countable graphs omitting a finite set of forbidden subgraphs. Ultimately the question is whether this is an algorithmically decidable problem as one varies the set of constraints. The model theoretic approach we developed with Shelah and Shi translates each instance of this problem into the problem of estimating the size of the algebraic closure of a finite set, where the notion of algebraic closure used depends directly on the set of forbidden subgraphs. As an application one may determine the cases in which there is a universal graph for the class of graphs omitting a specified tree. Ongoing work with Shelah suggests that it might be possible to treat the case of any single constraint along similar lines. In principle a similar analysis can be applied to other combinatorial structures, such as permutations omitting a pattern. (Received August 28, 2008)