

1046-05-373

Robert Gilman, Yuri Gurevich and **Alexei Myasnikov*** (alexeim@math.mcgill.ca),
Department of Mathematics and Statistics, McGill University, 805 Sherbrooke Street W.,
Montreal, Quebec H3A 2K6, Canada. *A Geometric Zero-One Law.*

Each relational structure X has an associated Gaifman graph, which endows X with the properties of a graph. If x is an element of X , let $B_n(x)$ be the ball of radius n around x . Suppose that X is infinite, connected and of bounded degree. A first-order sentence ϕ in the language of X is almost surely true (resp. a.s. false) for finite substructures of X if for every $x \in X$, the fraction of substructures of $B_n(x)$ satisfying ϕ approaches 1 (resp. 0) as n approaches infinity. Suppose further that, for every finite substructure, X has a disjoint isomorphic substructure. Then every ϕ is a.s. true or a.s. false for finite substructures of X . This is one form of the geometric zero-one law. We formulate it also in a form that does not mention the ambient infinite structure. In addition, we investigate various questions related to the geometric zero-one law. (Received August 28, 2008)