1047-05-481 **Jacques A Verstraete*** (jacques@ucsd.edu), 9500 Gilman Drive, La Jolla, CA 92037.

Independent dominating sets in graphs of girth five.

It is well-known that a graph on n vertices with minimum degree d contains a dominating set of size at most roughly $n(\log d)/d$, and this result is one of the standard examples of the probabilistic method. Furthermore, a random d-regular graph on n vertices almost surely has no smaller dominating set. In this talk, I will show that if a d-regular n-vertex graph has girth at least five, then it has an independent dominating set of size at most roughly $n(\log d)/d$. Since the graph consisting of $n/(2d)$ disjoint copies of the complete bipartite graph $K_{d,d}$ has no independent dominating set of size less than $n/2$, the girth condition cannot be relaxed. The d-regularity also cannot be relaxed, as will be shown using random graphs with varying degrees. The proof of this result is probabilistic and also yields an alternative proof of a recent result of Alon, Kim and Spencer on matchings in hypergraphs.

Join work with Ararat Harutyunyan and Paul Horn. (Received February 03, 2009)