1077-60-1243        **John C Wierman\*** (`wierman@jhu.edu`), Dept. of Applied Mathematics & Statistics, 100 Whitehead Hall, Johns Hopkins University, Baltimore, MD 21218. *Percolation threshold bounds derived by the substitution method without a reference lattice.* Preliminary report.

In percolation theory, the clustering behavior in an infinite random lattice graph model is studied. An important quantity is the percolation threshold, often interpreted as a phase transition point, above which infinite clusters form. Past applications of the substitution method used stochastic ordering to derive rigorous upper and lower bounds for the percolation threshold of a lattice graph by comparison with a percolation model on an exactly-solved lattice graph. For a class of dual pairs of graphs, an approach that does not require a reference lattice will be presented. (Received September 18, 2011)