1003-32-1024 **Michael R Douglas** and **Bernard Shiffman*** (`shiffman@math.jhu.edu`), Department of Mathematics, Johns Hopkins University, Baltimore, MD 21218, and **Steve Zelditch**. *Counting vacua using methods of complex analysis and geometry.*

We show how to count the vacua arising from Michael Douglas's program in string/M theory. Our methods are based on the statistical theory of critical points of random holomorphic sections of line bundles over Kahler manifolds.

A vacuum (or "universe") is associated with a critical point Y of a "superpotential" W, i.e., a holomorphic section of the natural line bundle L over the moduli space M of complex structures on a Calabi-Yau 3-fold. Since (W,Y) is unknown and there are myriad possibilities, an important physical problem is to determine how many vacua there are and how they are distributed. We apply methods of "statistical algebraic geometry" from joint work with P. Bleher to compute numbers of vacua. (Received October 02, 2004)

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