1077-VK-802 **Mark Huber** (mhuber@cmc.edu) and **Sarah Schott*** (schott@math.duke.edu). *TPA: A New Method for Approximate Counting.*

Many high dimensional integrals can be reduced to the problem of finding the relative measures of two sets. Often one set will be exponentially larger than the other. A standard method of dealing with this problem is to interpolate between the sets with a series of nested sets where neighboring nested sets have relative measures bounded above by a constant. Choosing these nested sets can be very difficult in practice. Here a new approach that creates a randomly drawn sequence of such sets is presented. This procedure gives faster approximation algorithms and a well-balanced set of nested sets that are essential to building effective tempering and annealing algorithms. (Received September 12, 2011)