1058-57-98 **Kenneth C Millett*** (millett@math.ucsb.edu), Department of Mathematics, UCSB, Santa Barbara, CA 93106, and **E. Panagiotou** and **S. Lambropoulou**. *The linking number and writhe of uniform random walks and polygons in confined spaces.*

Random walks and polygons are used to model polymers. We consider the extension of the writhe, self-linking number and linking number to open chains. We then study the average writhe, self-linking and linking number of random walks and polygons over the space of configurations as a function of their length. We show that the mean squared linking number, the mean squared writhe and the mean squared self-linking number of oriented uniform random walks or polygons of length n, in a convex confined space, are of the form $O(n^2)$. Moreover, for a fixed simple closed curve in a convex confined space, we prove that the mean absolute value of the linking number between this curve and a uniform random walk or polygon of n edges is of the form $O(\sqrt{n})$. Our numerical studies confirm those results. They also indicate that the mean absolute linking number between any two oriented uniform random walks or polygons, of n edges each, is of the form $O(n)$. Equilateral random walks and polygons are used to model polymers in θ-conditions. We use numerical simulations to investigate how the self-linking and linking number of equilateral random walks scale with their length. (Received February 08, 2010)