

韓國物理學會 會報

Bulletin of the Korean Physical Society

第 9 卷 第 1 號

Vol. 9 No. 1 April 1991

第 62 回 總會 프로그램, 論文抄錄集

日 時 : 1991. 4. 27(토)~28(일)

場 所 : 西江大學校

社團
法人 韓國物理學會

Korean Physical Society

F-2

Numerical test of Flory-type formulas for true self-avoiding walks on fractals.

Sang Bub Lee (Kyungpook National University). We present the numerical test for Flory-type formulas for true self-avoiding walks (TSAWs) on fractal substrates proposed by Rammal¹ and more recently by Bouchard and Georges.² We estimate by Monte Carlo simulations the critical exponent ν for TSAWs on Sierpinski gasket, infinite percolation cluster and percolation backbone obtained at percolation threshold, embedded all in two dimensions. Results were found to be in fairly good agreement with the predictions from both formulas for all cases, but appear to be in better agreement with those by Bouchard and Georges, as long as our simulations were carried out. We also present the preliminary results on three-dimensional infinite percolation clusters of fractal dimension larger than the upper marginal dimension of TSAWs, $d_c = 2$.

1. R. Rammal, J. Stat. Phys. **36**, 547 (1984).
2. J. P. Bouchard and A. Georges, Phys. Rev. B **39**, 2846 (1989).

F-3

Dissipative Dynamics and Bifurcations in the Billiard Problem

GwangIl KIM and Seunghwan KIM (POSTECH). We study a modified problem of the Sinai's billiards, where a point particle is moving inside the rectangular billiard table in the plane and scattered at the sides with a scattering angle given by the sum of an incident angle and a constant angle kick proportional to the incident angle. We have shown that when the geometry of the billiard table is square, there exist only two limiting behaviors, one stable and the other unstable, and the stable one is globally attracting.

We have observed that this stable orbit persists for an aspect ratio of the rectangle close to unity but for sufficiently large values of the aspect ratio, there exists a complicated sequence of bifurcations involving periodic orbits and Cantor orbits of many different rotating types.

F

F-4

Transition to Chaos in a Dissipative Standard-like Map, Sang-Yoon Kim and

Duck-Sung Lee (Kangwon Nat'l Univ.). We study the transition to chaos caused by overlap of resonances in a dissipative standard-like map exhibiting recurrence of invariant circles. The effects of the recurrence on the structure of a critical line at which the motion is always mode-locked are particularly investigated. When there is no recurrence of invariant circles, a smooth critical line exists. In the recurrence case, however, the critical line is folded back and has discontinuous parts. At this line the mode-locked intervals trace a folded devil's staircase with isolated parts. Scaling behavior of the complementary set to the folded staircase is also discussed.