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driven by an electric motor through a coupling. The vibration amplitude and phase due to the original unbalance are measured using the vibration analyzer and the phase indicator. The position and magnitude of the compensating mass are determined from the vector diagram.

Ec-23 The Application of Cross-correlation Properties for Woven Glass Fiber Composite Analysis. Young Hee Lee(Keimyung Univ.), Kanji Ono(U.C.L.A.) and H.C. Kim (KAIST). This paper discuss Experimental results obtained by the potentiality of cross correlation function as a tool for analyzing propagation of wave in a aluminum and woven glass fiber composite. Each propagated wave have its own characteristic time delay, and examination of the cross correlation function of input and output give notice the most proper wave velocity, significant path and energy transport rate. Using above distinctive feature, the wave propagation velocities and absorption properties according to the frequency in a woven glass fiber composite were measured. On the basis of these preliminary results, the woven fiver locations in these composite are investigated.

F-1 Resonance and Chaos in Systems with Competing Periods. Seunghwan KIM (POSTECH). When competing periods exist, physical systems often show resonance phenonema and chaotic oscillations. For Hamiltonian systems, resonance often introduce instability and difficulties in perturbational analysis. For dissipative systems, resonance leads to mode-locking - locking of periods to the ratio of integers over a range of system parameters. We study the fundamental mode-locking structure of the systems with two and three competing periods and the mechanisms for chaotic oscillations.

1. Per Bak, *Physics Today*, 38, December 1986.
2. Seunghwan Kim, Robert Mackay, and John Guckenheimer, *Nonlinearity*, **2**, 391,1989.
3. Claude Baesens, John Guckenheimer, Seunghwan Kim, and Robert Mackay, *Quasiperiodicity, Mode-locking, and Toroidal Chaos in Torus Diffeomorphisms*, preprint, 1990.

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F-2 Resurrection of KAM Tori in Nonalytic Twist Maps. B. Hu and J. Shi(Univ. of Houston) and Sang-Yoon Kim(Kangwon Nat'l Univ.). We have studied the behavior of KAM tori in a class of nonanlytic twist maps in which the nonlinear function is endowed with a varying degree of inflection z. Many novel features have been discovered. Reappearence of KAM tori has been observed for z>3. An "inverse residue criterion" is introduced to determine the reappearence point. We have also studied the scaling behavior at the disappearence and reappearence points. The scaling exponents are found to vary with z for 2<z<3, but are independent of z for z>3.

F-3 Behavior of Invariant Circles in Dissipative Standard-like Maps. Sang-Yoon Kim(Kangwon Nat'l Univ.). We study the behavior of invariant circles in a family of "dissipative standard-like maps" in which the nonlinear function is a "sine-like" function with a parameter z. The inverse of the parameter z denotes the "distance" from the sine function. A "residue criterion" is introduced to locate the disappearence points and reappearence points of invariant circles. Reappearence of invariant circles is observed when z is sufficiently small. This reappearence phenomena can be also explained in terms of "resonance deoverlapping". The parameter scaling behavior and orbital scaling behavior near the most rarefied region are also studied. The scaling factors are the same as those in the circle maps with cubic inflection points.

F-4 True self-avoding walks on a percolation cluster. Sang Bub Lee (Kyungpook Nat'l Univ.). We investigate by Monte Carlo simulations the critical behavior of true self-avoiding walks on a percolation cluster performed very close to percolation threhold. Specifically, we generate the true self-avoiding walks on a site-percolated "incipient" infinite cluster which spans the lattice in both directions for various values of self-avoidance parameter $g \geq 0$. We found that such walks exhibit the critical behavior different from that of ordinary self-avoiding walks and also from that of random walks with no constraint. The Flory exponent obtained was about 0.43 for all $g>0$, which agrees well with the Flory-type formula suggested by Rammal.[1]

1. R. Rammal, J. Stat. Phys. 36, 547 (1984).

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