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제25권 제2호

한국물리학회

회보

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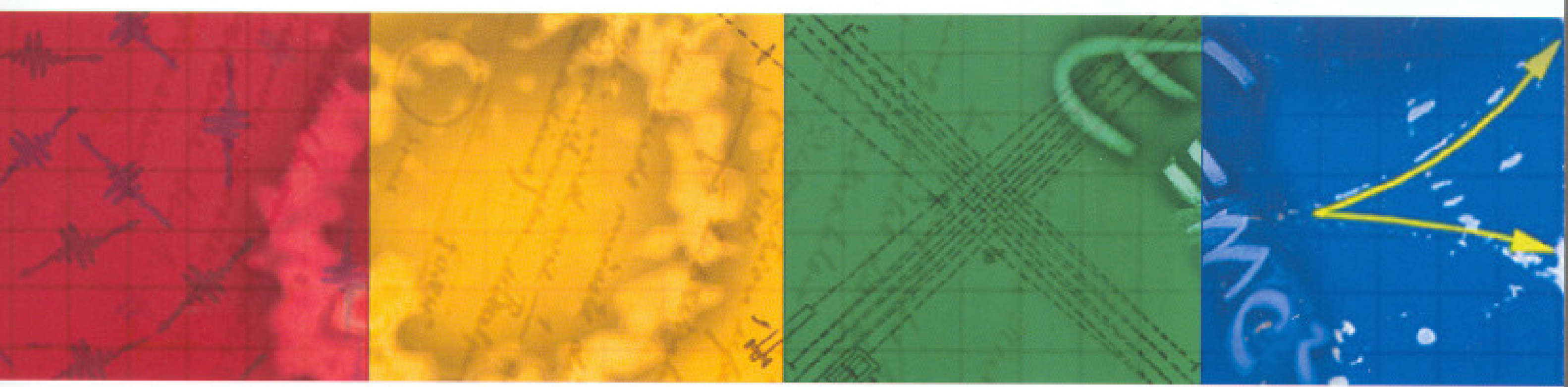

2007년 봄 학술논문발표회 및 제83회 정기총회

휘닉스파크

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vasion rule; the lowest-pressure site among the neighboring sites to the invaded cluster is invaded in each invasion step until the extraction site is reached. The fractal dimension of the invaded clusters is the same as that of the ordinary percolation cluster at criticality, i.e. at p_c, independent of the pressure on the extraction site p_e. The mass distribution exhibited a power-law behavior $P(m) \propto m^{-\alpha}$. the index α for $p_e < p_c$ appears to be independent of the value of $p_e$and also independent of the lattice dimensionality. When $p_e = p_c$, on the ohter hand, the index α appears to be weakly dependent on the lattice dimensionality. However, the conjecture in the earlier work [Phys Rev E 72, 041404 (2005)] $\alpha = \tau - 1$, τ being the exponent characterizing the cluster size distribution, $n_s \propto s^{-\tau}$, appears to be incorrect.

P1

포스터세션

Fp

Fp-028 **Fisher Zeros of Six-state Clock Model on a Square Lattice** 황 치옥, 김 승연[1], 김 진민[2](*국가수리과학연구소, [1]충주대학교 [2]숭실대학교*) We investigate the phase transitions of the six-state clock model with nearest neighbour interactionson a square lattice. We obtain the density of states via Wang-Landau algorithms and study Fisher zerosto get phase transition temperatures.

Fp-029 **Strange Nonchaotic Bursting in Quasiperiodically Forced Neural Oscillators** LIM Woochang, KIM Sang-Yoon[1](*아주대학교 의과학연구소, [1]강원대학교 물리학과*) We study the neural bursting activity (alternating between a silent phase and a bursting phase of repetitive spiking) in are presentative Hindmarsh-Rose model. In addition to the usual periodic and chaotic burstings, a new type of strange nonchaotic burstings are found to occur in the quasiperiodically forced case. This strange nonchaotic bursting state may appear through at ransition from a silent state. Using a rational approximation to the quasiperiodic forcing, the mechanism for the occurrence of such a strange nonchaotic bursting is investigated. These strange nonchaotic burstings are characterized in terms of the interburst intervals, the bursting length (i.e., the time interval between the first and last spikes in each burst), the number of spikes in each burst, and the peak to base ratios in the power spectra. The effect of noise on this strange nonchaotic bursting state is also studied. Finally, a transition from a bursting to a beating (continuous spiking) is briefly discussed.

Fp-030 **The Effect of Mode Coupling in Coupled Dielectric Microdisks** RYU Jung-Wan, KIM Sang Wook(*부산대학교*) We study the mode coupling between quasi-eigenmodes in coupled dielectric microdisks. The positions in complex energy plane of modes and the corresponding mode distributions in real spaceis obtained according to variation of inter-disk distance and size difference between two microdisks. The interesting phenomena such as the directional emission and avoided resonance crossing can be explained by mode coupling.

Fp-031 **Modeling and Solutions of Queue Systems in Human Dynamics** KIM Jin S., KAHNG Byungnam, KIM Doochul(*Department of Physics and Astronomy, Seoul National University.*) The dynamics of queue has been intensively studied by the needs in the fields of computer sciences, massive manufacturing managements, and so on. In traditional models, the number of events coming into the system in unit time is assumed to be randomly distributed and thus well approximated by Poisson processes. On the other hand, the analysis of real human activity data such as e-mail corresponding logs and wireless communication archives shows that the number of input events follows power law, and hence here we introduce a generalized queue model whose number of input tasks is given by a power law. Also we consider the case that the queuing dynamics is performed based on priority instead of first-in-first-out protocol. We present numerical result and compare it with the first passage time distribution of Levy flight random walks.

Fp-032 **Influence of ocean bottom topography on the characteristics of edge waves** 유 대중, 김 기홍 (*아주대 에너지시스템학부*) As an ocean surface wave approaches a plane sloping beach, some of its energy is trapped near the shoreline and excites an edge wave at well-defined resonance frequencies. We investigate the influence of ocean bottom topography on the characteristics of edge waves, using an exact method based on the invariant imbedding theory. When the ocean depth increases linearly with the distance from the beach, our results agree very well with known analytical solutions. We find exact solutions for the edge wave frequencies and field distributions, when the ocean