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transition on solid surface. In the present study, we present a microscopic description of nucleation phenomena involving clusters using a quantum statistical mechanical approach by hybridizing an effective Hamiltonian approach (partially dressed self-energy in Dyson's equation is introduced in this approach) and a conventional statistical mechanical method. Free energies and barrier heights are explored for various systems to realistically access nucleation rates. Finally propensity rules important for understanding nucleation mechanism will be highlighted based on the present study. These newly found propensity rules are in complete agreement with measurements.

F-2 Nonequilibrium Self-Organization versus Temporal Chaos. 문희태(한국과학기술대학).

Spatio-temporal dynamics of self-organized structures in the perturbed Nonlinear Schrödinger system are investigated by means of singular perturbation methods. Closely associated with spacial patterns, two types of temporal chaos are contrasted : 1) Fluctuation type ; Macroscopic organized motions are not destroyed but constantly corrected. Aperiodicity is brought by a cascade of period-doubling. 2) Turbulence type ; Random occurence of spatial coherence characterizes the dynamics. This involves homoclinic transverse intersection.

F-3 Period-1 Scaling Behaviors for Period Doublings in Symmetric 4-dimensional Volume-preserving Maps. Sang-Yoon Kim (KNU). We study period-doublings in symmetric 4-dimensional volume-preserving maps which was first studied by Mao and Helleman[1]. We extended the 'bifurcation route' defined by Mao and Helleman[1] and find that there are more 'special bifurcation paths' than those found by them. Furthermore,we find that the fundamental noncoordinate scaling factors are δ_1 and δ_2(divergence rates from the fixed map) and δ_1' and δ_2' (convergence rates to the fixed map). That is, the parameter scaling factors of any 'bifurcation paths' are combinations of these four fundamental scaling factors.

1.J.M.Mao and R.H.G. Helleman, Phys. Rev. A35, 1847(1987)

F-4 Period-2 Scaling Behaviors for Period Doublings in Symmetric 4-dimensional Volume-preserving Maps. Sang-Yoon Kim (KNU),Bambi Hu and Jian-Min Mao (Univ. of Houston). We study period doublings in a symmetrically coupled Henon's map. We find that there is only one kind of 'period-2 route' and there are an infinity number of 'period-2 paths' for each 'period-2 route'. The critical behaviors at the

accumulation point of all 'period-2 paths' exhibit 'period-2' scaling behaviors. We obtain the four fundamental noncoordinate scaling factors δ_1 and δ_2(divergence rates from the period-2 map) and δ_1' and δ_2' (convergence rates to the period-2 map)by a direct numerical method and a renormalization method. Furthermore, we expect that all the critical behaviors for period doublings can be classified by the 'route-sequence' defined by us.

F-5 표준 사상에서의 대칭선 분석 및 혼돈*. 김수용 (한국과학기술대학), 전우수(공주교대), Y. H. Ichikawa(Nagoya University). Low dimension 고전 해밀토니안계 속에 잠재되어 있는 통계적 성질을 탐구하는 수단 방법으로 대칭선 분석을 시도한다. 표준사상에서 존재하는 가속기 모드(accelerator mode)는 stochastic diffusion을 증가시킨다. 안정된 fixed point 주위에 산재하고 있는 주기궤도의 구조를 대칭선을 중심으로 논의하며 이 방법을 가속기 모드의 경우에도 적용할 것이다. Period-3를 가진 가속기 궤도의 squeeze 효과를 보일 것이며 q≥4인 Poincaré-Birkhoff chain의 발생과정과는 근본적으로 다른 양상을 가진다는 사실을 밝힐 것이다.

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F-6 Symmetries and Stochasticity of Henon Map*. Chong Sup Song, Chong Bae Hong (Seoul National University) and Soo Yong Kim (Korea Institute of Technology). Studies of chaos in Hamiltonian system have been attracting active interests in various fields of physics, such as accelerator physics, plasma physics and celestrial physics. The global stochastic properties of Henon map are shown to be subjected to critical influence of the intermittent transition between periodic orbits and chaotic orbits.[1,2] Symmetry of the map provides useful information to predict location of the fixed periodic points and on-set of the bifurcation at these points. Extending Pina and Lara's analysis, we have undertaken detailed analysis of the fixed periodic points and have discussed new aspects of the birth of multiple periodic orbits and their evolution depending on stochastic parameter.

1. M. Henon, Quarterly of Applied MATH., 27, 291 (1969).

2. J. P. van der Weele, H. W. Capel, T. P. Valkering, and T. Post, Physica A, 147, 499 (1988).

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F-7 A Simple Algebraic Technique in the Generalized Continued-Fraction Representation. Sam Nyung Yi, Jai Yon Ryu, and Sang Don Choi (Kyungpook National University). We obtained a generalized continued fraction representation containing two memory functions by proceeding directly from the Laplace transform of time corre-