한국물리학회

회보

BULLETIN OF THE KOREAN PHYSICAL SOCIETY

제21권 제2호

2003년도 가을 학술논문발표회
논문초록집

2003년 10월

사단법인 한국물리학회
THE KOREAN PHYSICAL SOCIETY

(head layer). It is shown that immunization indeed turns periodic rages of an epidemic into small fluctuation. The study also reveals that, in a certain situation, immunization actually plays an adverse role and helps the disease survive. We argue that the presence of two different characteristic time scales contributes to the immunization dynamics observed.

F-P032 **Mechanism For The Partial Synchronization In Coupled Chaotic Systems** SON Woo-Sik, LIM Woochang[1], KIM Sang-Yoon[1], PARK Young-Jai(*Sogang Univ. [1]Kangwon Nat'l Univ.*) We investigate the dynamical mechanism for the partial synchronization in three coupled one-dimensional maps. A completely synchronized attractor on the diagonal becomes transversely unstable via a blowout bifurcation, and then a two-cluster state, exhibiting on-off intermittency, appears on an invariant two-dimensional plane. If the two-cluster state becomes transversely stable, then a partial synchronization may occur on the invariant plane. Otherwise, total desynchronization takes place. It is found that the transverse stability of the two-cluster state may be determined through the competition between its laminar and bursting components. When the "transverse strength" (i.e., a weighted transverse Lyapunov exponent) of the laminar component is larger (smaller) than that of the bursting component, a partially synchronized (totally desynchronized) attractor appears through the blowout bifurcation.

F-P033 **Dynamical Origin for the Occurrence of Asynchronous Hyperchaos and Chaos via Blowout Bifurcations** LIM Woochang, KIM Sang-Yoon, OTT Edward[1], HUNT Brian[1](*강원대 [1]University of Maryland, U.S.A.*) We investigate the dynamical origin for the occurrence ofasynchronous hyperchaos and chaos via blowout bifurcations incoupled chaotic systems. An asynchronous hyperchaotic or chaoticattractor with a positive or negative second Lyapunov exponentappears through a blowout bifurcation. It is found that the signof the second Lyapunov exponent of the newly-born asynchronousattractor, exhibiting on-off intermittency, is determined throughcompetition between its laminar and bursting components. When the "strength"(i.e., a weighted second Lyapunov exponent) of thebursting component is larger(smaller) than that of the laminarcomponent, an asynchronous hyperchaotic(chaotic) attractorappears.

F-P034 **Regular Wave Formation by Time Delay in Randomly Coupled Oscillators** 고 태욱, 정 성옥, 문 희태(*한국과학기술원 물리학과*) We investigate the dynamics of coupled oscillators with time-delayed interactions mediated by signals of finite and constant speed. It is shown that time delays proportional to the Euclidean distances between interacting oscillators can induce regular traveling waves even though oscillators are randomly coupled. Stability criteria for wave states and synchronous states are discussed.

F-P035 **A Nonlinear Noise Reduction Scheme Based On Information Theory** BAEK Seung Ki, MOON Hie-Tae(*KAIST.*) We developed a noise reduction scheme based on information theory, operating on condition of knowing chaoticity and noise level. It does not solve error-minimization problem, but instead completely removes noisy parts and then recovers them from other remaining credible parts. We also propose dynamics can be inferred using the concept of predicting power, induced from the above scheme.

F-P036 **제주산 군소(Aplysia)의 복부 신경절에 있는 신경 세포들의 발화 양상** HYUN Nam Gyu, KIM Yong Joo, CHO Hyoung Jun, PARK Duck-Gun[1](*제주대학교 물리학과. [1]한국원자력연구소*) 지난 2003년 7월 제주도 제주대학교 신경 생물물리 실험실에 있는 실험 장비들을 이용하여 남제주군 성산읍 신양리 해안에서 해녀가 채취한 군소의 복부 신경절에 있는 여러 신경 세포들에서 발생하는 신호들을 측정하였으며 A/D converter 를 이용하여 이것들을 자료화하였다. 이 포스터 발표 자료에서는 이 신경 세포들에서 발생하는 Beating 및 Bursting 신호들 뿐만 아니라 이것들의 복합적인 형태의 신호를 내는 세포들의 대략적인 위치와 그 신호의 모양들을 정리하여 제시 한다.