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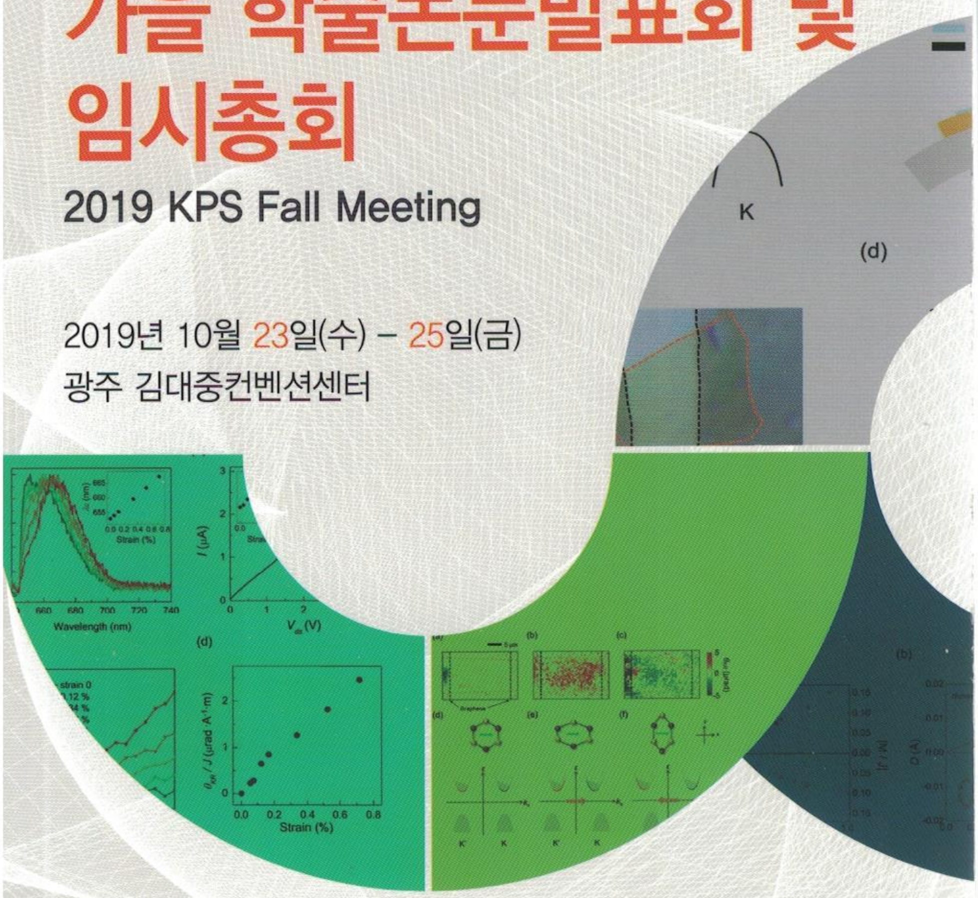
2019년
가을 학술논문발표회 및 임시총회

2019 KPS Fall Meeting

2019년 10월 23일(수) - 25일(금)
광주 김대중컨벤션센터



후원 : GWANGJU cvb
광주관광컨벤션뷰로

C2.07 [10:24 - 10:36]

Homophily and minority-group size explain perception biases in social networks / 이은[*1], KARIMI Fariba[2], WAGNER Claudia[2, 3], JO Hang-Hyun[4, 5], STROHMAIER Markus[2, 6], GALESIC Mirta[7, 8, 9] ([1]Department of Mathematics, University of North Carolina at Chapel Hill, [2]Department of Computational Social Science, GESIS, [3]Institute for Web Science and Technologies, University of Koblenz-Landau, [4]Asia Pacific Center for Theoretical Physics, [5]Department of Physics, Pohang University of Science and Technology, [6]Department for Society, Technology and Human Factors & Department of Computer Science, RWTH Aachen University, [7]Santa Fe Institute, [8]Complexity Science Hub Vienna, [9]Harding Center for Risk Literacy, Max Planck Institute for Human Development)

C2.08 [10:36 - 10:48]

Cluster burst synchronizaton in a scale-free network of inhibitory bursting neurons / KIM Sang-Yoon[1], LIM Woochang[*1] ([1]Institute for Computational Neuroscience and Department of Science Education, Daegu National University of Education)

[C3] See [T2-co]

[C4-co] Other condensed materials/Instruments

2019. 10. 24 Thursday 09:00~10:24 Room: 208

좌장 : 이현휘 포항공대 포항가속기연구소

Chair : LEE Hyun Hwi (Pohang Accelerator Laboratory)

C4.01* [09:00 - 09:12]

Femtosecond observation on electron-hole equilibration in superheated copper using an x-ray free electron laser / 조병익[*1, 2], 이종원[*1, 2], 김민주[1], 강경보[1, 2], 조민상[1, 2], 박상한[3], 김민석[3], 권순남[3] ([1]광주과학기술원 물리광과학과, [2]IBS 초강력 레이저과학 연구단, [3]포항가속기연구소)

C4.02* [09:12 - 09:24]

In situ X-ray microdiffraction studies of Metal-Insulator Phase Behaviour of Individual VO_2 Microcrystals / 노도영[*1], MOHD Faiyaz[1], HA Sungsoo[2], OH Ho Jun[1], LEE Su Young[3] ([1]광주과학기술원 물리광과학과, [2]School of Material Science Engineering, GIST, [3]Pohang Accelerator Laboratory)

C4.03* [09:24 - 09:36]

Time Resolved Pump-Probe XRD Study of NiO Thin Film Employing High flux and Energy dispersive Characteristic of XFEL Pink Beam Source. / 권오영[1], 하성수[2], 황병준[1], 오호준[1], 최석준[1], MOHD Faiyaz[1], 한승현[1], 윤영민[1], ANWAR Ijaz[1], 김준형[1], 노도영[*1] ([1]광주과학기술원 물리광과학과, [2]광주과학기술원 신소재공학부)

2019 가을학술논문발표회 및 임시총회(2019 KPS Fall Meeting)
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Cluster burst synchronizaton in a scale-free network of inhibitory bursting neurons

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Abstract:

We consider a scale-free network of inhibitory Hindmarsh-Rose (HR) bursting neurons, and make a computational study on coupling-induced cluster burst synchronization by varying the average co upling strength J_0. For sufficiently small J_0, non-cluster desynchronized states exist. However, wh en passing a critical point J^*_c $(\simeq 0.16)$, the whole population is segregated into 3 clusters via a co nstructive role of synaptic inhibition to stimulate dynamical clustering between individual burstings, and thus 3-cluster desynchronized states appear. As J_0 is further increased and passes a lower th reshold J^*_l $(\simeq 0.78)$, a transition to 3-cluster burst synchronization occurs due to another constru ctive role of synaptic inhibition to favor population synchronization. In this case, HR neurons in eac h cluster make burstings every 3rd cycle of the instantaneous burst rate $R_w(t)$ of the whole popul ation, and exhibit burst synchronization. However, as J_0 passes an intermediate threshold J^*_m $(\simeq 5.2)$, HR neurons fire burstings intermittently at a 4th cycle of $R_w(t)$ via burst skipping rat her than at its 3rd cycle, and hence they begin to make intermittent hoppings between the 3 cluster s. Due to such intermittent intercluster hoppings via burst skippings, the 3 clusters become broken up (i.e., the 3 clusters are integrated into a single one). However, in spite of such break-up (i.e., di sappearance) of the 3-cluster states, (non-cluster) burst synchronization persists in the whole pop ulation, which is well visualized in the raster plot of burst onset times where bursting stripes (comp osed of burst onset times and indicating burst synchronization) appear successively. With further in crease in J_0, intercluster hoppings are intensified, and bursting stripes also become dispersed mor e and more due to a destructive role of synaptic inhibition to spoil the burst synchronization. Event ually, when passing a higher threshold J^*_h $(\simeq 17.8)$ a transition to desynchronization occurs via c omplete overlap between the bursting stripes. Finally, we also investigate the effects of stochastic noise on both 3-cluster burst synchronization and intercluster hoppings.

Keywords:

Cluster burst synchronization, Localization of inter-burst-intervals, Intercluster hoppings, Inhibitor y bursting neurons

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