目　　录

Title：**New Interference Alignment Algorithms Based on Desired Signals for Two-Cell MIMO Interfering Multiple-Access Channels**

Authors：Lijun Bai , Li Hao

Sources: *IEEE COMMUNICATIONS LETTERS,* 2015, 19(6):997-1000 **(A3)**

Abstract：In this paper, we propose two new iterative algorithms termed maximum-power interference alignment (MP-IA) and maximum-SINR IA (MSINR-IA) in two-cell multiple-input multiple-output (MIMO) interfering multiple-access channels (IMACs) which optimize the IA reference vectors from the perspective of maximizing the effective power of the desired signals and received signal to interference and noise (SINR), respectively. Under perfect feedback as well as limited feedback scenarios, the proposed schemes are evaluated in terms of the average sum rate and bit error rate (BER) performance and the simulation results show the advantages of the proposed schemes over existing algorithms.

Keywords: Multiple-access channel; interference alignment; limited feedback; MIMO.

Title: **Generalized weighted composition operators from Zygmund spaces to Bloch-Orlicz type spaces**

Author: Hong-bin Bai, Zhi-jie Jiang

Sources: *Applied Mathematics and Computation* ,273 (2016) :89–97 **(A2)**

Abstract: Let $\mathbb{D}$ be the open unit disk in the complex plane $\mathbb{C}$ and $H(\mathbb{D})$ the class of all analytic functions on $\mathbb{D}$. Let ϕ be an analytic self-map of $\mathbb{D}$ and $\psi \in H(\mathbb{D})$. In this paper the boundedness and compactness of the generalized weighted composition operator $D^n_{\varphi,\psi} f = \psi f^{(n)} \circ \varphi$ from the Zygmund space to the Bloch – Orlicz space and the little Bloch – Orlicz space are characterized

Keywords: Zygmund space; Bloch–Orlicz space; Little Bloch–Orlicz space; Generalized weighted composition operator; Boundedness; Compactness.

Title: **On weak solutions to a shallow water wave model of moderate amplitude**

Author: Yunxi Guo, Yonghong Wu , Shaoyong Lai

Sources: *Applicable Analysis,* 2015, DOI:10.1080/00036811.2015.1073265 **(A3)**

Abstract: The existence of global weak solutions for a dissipative model equation for shallow water wave of moderate amplitude is studied in the space $C([0,\infty) \times \mathrm{R}) L^\infty((0,\infty); H^1(\mathrm{R}))$ without the sign condition on the initial value by employing the limit technique of viscous approximation. A new one-sided lower bound and the higher integrability estimate act a key role in our analysis. Our results partly extend the work of Coclite et al. on the existence of global weak solutions to the generalized hyperlastic-rod equation.

Keywords: global weak solutions; viscous approximation; a shallow water model of moderate amplitude

Title: **Generalized product-type operators from weighted Bergman–Orlicz spaces to Bloch–Orlicz spaces**

Author: Zhi-jie Jiang

Sources: *Applied Mathematics and Computation* ,268 (2015):966–977 **(A2)**

Abstract: Let $\mathbb{D}$ be the open unit disk in the complex plane, Φ an analytic self-map of $\mathbb{D}$ and ψ an analytic function on $\mathbb{D}$. Let D^n be the nth differentiation operator and $W_{\phi,\psi}$ the weighted composition operator. In this paper the boundedness and compactness of the generalized product-type operators $D^nW_{\phi,\psi}$ and $W_{\phi,\psi}D^n$ from weighted Bergman – Orlicz spaces to Bloch – Orlicz spaces are characterized.

Keywords: Weighted Bergman–Orlicz spaces; Generalized product-type operators; Bloch–Orlicz spaces; Boundedness; Compactness

Title: **On a new operator from Hardy space to n-th weight-type space on the upper half-plane**

Author: ZHI-JIE JIANG, YONG YANG, JIAN-MIN YUE

Sources: *J. COMPUTATIONAL ANALYSIS AND APPLICATIONS, 2015,* 18(4):715-720 **(A4)**

Abstract: Motivated by some recent results of operators on analytic function spaces, the boundedness of operator defined by Wu, φm f = u · f(m) o φ from the Hardy space to the n-th weighted-type space on the upper half-plane Π+ = (z ∈ ℤ : Imz > 0} is characterized.

Keywords: Hardy space; upper half-plane; n-th weighted-type space; a new operator.

Title: **On a product-type operator from weighted Bergman–Orlicz space to some weighted type spaces**

Author: Zhi-jie Jiang

Sources: *Applied Mathematics and Computation,* 256 (2015) 37 – 51 **(A2)**

Abstract: Let $\mathbb{D} = \{z \in \mathbb{C} : |z| < 1\}$ be the open unit disk, φ an analytic self-map of $\mathbb{D}$ and ψ an analytic function on $\mathbb{D}$. Let D be the differentiation operator and $W_{\varphi,\psi}$ the weighted composition operator. The boundedness and compactness of the product-type operator $DW_{\varphi,\psi}$ from the weighted Bergman – Orlicz space to the Bers type space, weighted Bloch space and weighted Zygmund space on $\mathbb{D}$are characterized.

Keywords: Weighted Bergman – Orlicz spaces; Product-type operators; Weighted Zygmund spaces; Weighted Bloch spaces; Boundedness; Compactness

Title: **On Stevic-Sharma operator from the Zygmund space to the Bloch-Orlicz space**

Author: Zhi-jie Jiang

Sources: *Jiang Advances in Difference Equations,* (2015) 2015:228 **(A3)**

Abstract: Let D be the open unit disk in the complex plane C, ϕ an analytic self-map of D and *H*(D) the space of all analytic functions on D. In order to unify the products of composition, multiplication, and differentiation operators, Stevi′ c and Sharma introduced the following so-called Stevi′ c-Sharma operator:$T\ \psi 1,\ \psi 2,\phi f\ (z) =\ \psi 1(z)f\ (\phi(z)) +\ \psi 2(z)f\ \_(\phi(z)),\ f\ \in\ H$(D), where $\psi 1,\ \psi 2\ \in\ H$(D). Here we characterize the boundedness and compactness of the operator $T\ \psi 1,\ \psi 2,\phi$ from the Zygmund space to the Bloch-Orlicz space.

Keywords: Zygmund space; Bloch-Orlicz space; Stevi′ c-Sharma operator; boundedness; compactness

Title: **Product-type operators from weighted Bergman-Orlicz spaces to weighted Zygmund spaces**

Authors: Zhi-jie Jiang

Sources: *Bull. Korean Math. Soc.* 2015,52(4): 1383-1399 **(A4)**

Abstract: Let D = {z 2 C : |z| < 1} be the open unit disk in the complex plane C, ' an analytic self-map of D and an analytic function in D. Let D be the differentiation operator and W', the weighted composition operator. The boundedness and compactness of the product-type operator W', D from the weighted Bergman-Orlicz space to the weighted Zygmund space on D are characterized.

Keywords: weighted Bergman-Orlicz spaces, product-type operators, weighted Zygmund spaces, boundedness, compactness

Title: **A new modified artificial bee colony algorithm with exponential function adaptive steps**

Authors: WeiMao, Heng-you Lan*, Hao-ru Li

Sources: *Computational Intelligence and Neuroscience,* 2015, Article ID 807630 **(A4)**

Abstract: As one of the most recent popular swarm intelligence techniques, artificial bee colony algorithm is poor at exploitation and hassome defects such as slow search speed, poor population diversity, the stagnation in the working process, and being trapped intothe local optimal solution. The purpose of this paper is to develop a new modified artificial bee colony algorithm in view of theinitial population structure, subpopulation groups, step updating, and population elimination. Further, depending on oppositionbasedlearning theory and the new modified algorithms, an improved S-type grouping method is proposed and the original way of roulette wheel selection is substituted through sensitivity-pheromone way.Then, an adaptive step with exponential functions is designed for replacing the original random step. Finally, based on the new test function versions CEC13, six benchmark functions with the dimensions D = 20 and D = 40 are chosen and

applied in the experiments for analyzing and comparing the iteration speed and accuracy of the newmodified algorithms. The experimental results show that the newmodified algorithm has faster and more stable searching and can quickly increase poor population diversity and bring out the global optimal solutions.

Title: **Perturbation technique for a class of nonlinear implicit semilinear impulsive integro-differential equations of mixed type with noncompactness measure**

Authors: Heng-you Lan, Yi-shun Cui

Sources: *Lan and Cui Advances in Difference Equations,* (2015) 2015:11 **(A3)**

Abstract: By using the Arzela-Ascoli theorem, the Bellman inequality, and a monotone perturbation iterative technique in the presence of lower and upper solutions, we discuss the existence of mild solutions for a class of nonlinear first-order implicit semilinear impulsive integro-differential equations in Banach spaces. Under wide monotone conditions and the noncompactness measure conditions, we also obtain the existence of extremal solutions and a unique mild solution between lower and upper solutions.

Keywords: nonlinear first-order implicit semilinear impulsive integro-differential equation; monotone iterative technique; monotone condition and noncompactness measure condition; lower and upper solution; existence and uniqueness

Title: **Solving implicit mathematical programs with fuzzy variational inequality constraints based on the method of centres with entropic regularization**

Authors: Heng-you Lan, Juan J. Nieto

Sources: *Fuzzy Optim Decis Making,* (2015) 14:493–511 **(A3)**

Abstract: The purpose of this paper is to consider a class of mathematical programs with fuzzy implicit variational inequality constraints in finite dimension real spaces. By using the “tolerance approach” and the fuzzy set theory, we also show that solving the fuzzy mathematical program problem with fuzzy implicit variational inequality constraints is equivalent to solving a fuzzy implicit complementarity constrained optimization problem, and the fuzzy implicit complementarity constrained optimization problem can be converted to a regular nonlinear parametric programming problem. Further, a new smoothing approach based on a version of the “method of centres” with entropic regularization for solving the resulting optimization problem and our main results are presented and a numerical example is provided to illustrate our main results applying quasi-Newton line search of MATLAB software.

Keywords: Fuzzy mathematical program ; Fuzzy implicit variational inequality ; Parametric membership function; Tolerance approach; Method of centres with entropic regularization

Title: **Limit properties of exceedance point processes of strongly dependent normal sequences**

Author: Fuming Lin, Daimin Shi, Yingying Jiang

Sources: *Journal of Inequalities and Applications,* (2015) 2015:63 **(A3)**

Abstract: In this paper, we define an in plane Cox process and prove the time-normalized point process of exceedances by a dependent normal sequence converging to the Cox process in distribution under some mild conditions. As some applications of the convergence result, two important joint asymptotic distributions for the order statistics are derived.

Keywords: Cox process; exceedance point process; strongly dependent normal sequences; *k*th maxima

Title: **A CHARACTERIZATION OF L4(3) BY NSE**

Author: SHITIAN LIU , YUNXIA XIE

Sources: *MATH. REPORTS 17(67),* 3 (2015), 327-335 **(A4)**

Abstract: Let $\omega(G)$ be the set of element orders of G. For $k \in \omega(G)$ let sk be the number of elements of order k in G. Let $nse(G) = \{sk \mid k \in \omega(G)\}$. The group $L4(2) \cong A8$ is uniquely determined by nse. In this paper, we prove that if G is a group such that $nse(G)=nse(L4(3))$, then $G \cong L4(3)$.

Keywords: element order, projective special linear group, Thompson's problem, number of elements of the same order.

Title: **OD-characterization of some alternating groups**

Author: Shitian LIU

Sources: *Turkish Journal of Mathematics,* (2015) 39: 395- 407 **(A4)**

Abstract: Let G be a finite group. Moghaddamfar et al. defined prime graph $\Gamma(G)$ of group G as follows. The vertices of $\Gamma(G)$ are the primes dividing the order of G and two distinct vertices p, q are joined by an edge, denoted by $p \sim q$, if there is an element in G of order pq. Assume ... with P1 k and nature numbers αi with i = 1, 2, …, k. For $p \in \pi(G)$, let the degree of p be $deg(p) = |\{q \in \pi(G) \mid q \sim p\}|$, and $D(G) = (deg(p1); deg(p2); \ldots, deg(pk))$. Denote by $\pi(G)$ the set of prime divisor of |G|. Let GK(G) be the graph with vertex set $\pi(G)$ such that two primes p and q in $\pi(G)$ are joined by an edge if G has an element of order $p \cdot q$. We set s(G) to denote the number of connected components of the prime graph GK(G). Some authors proved some groups are OD-characterizable with $s(G) \geq 2$. Then for s(G) = 1, what is the influence of OD on the structure of groups? We knew that the alternating groups Ap+3, where $7 \neq p \in \pi(100!)$, A130 and A140 are OD-characterizable. Therefore, we naturally ask the following question: if s(G) = 1, then is there a group OD-characterizable? In this note, we give a characterization of Ap+3 except A10 with

s(Ap+3) = 1, by OD, which gives a positive answer to Moghaddamfar and Rahbariyan's conjecture.

Keywords: Order component, element order, alternating group, degree pattern, prime graph, Simple group

Title: **Multiple solutions for a p-biharmonic equation with nonlinear boundary conditions**

Author: Wen-Wu Pan, Xu-Dong Lin

Sources: *ScienceAsia* ,41 (2015): 205–208 **(A4)**

Abstract: In this paper, we obtain a multiplicity result for the *p*-biharmonic equation with smooth boundary

Keywords: critical point, variational method

Title: **Planar dust-acoustic waves in electron–positron–ion–dust plasmas with dust-size distribution under higher-order transverse perturbations**

Author: Hong-Yan Wang, Kai-Biao Zhang

Sources: *PRAMANA—journal of physics*, 2015, 84(1):145-153 （**A4**）

Abstract: Propagation of small but finite nonlinear dust-acoustic solitary waves are investigated in a planar unmagnetized dusty plasma, which consists of electrons, positrons, ions and negatively charged dust particles with different sizes and masses. A Kadomtsev–Petviashvili (KP) equation is obtained by using reductive perturbation method. The effect of positron density and positron–electron temperature ratio on dust-acoustic solitary structures are studied. Numerical results show that the increase in positron number density increases the amplitude of hump-like solitons but decreases the dip-like solitary waves. Furthermore, increase in the positron–electron temperature ratio results in the decrease of the amplitude of dip-like solitary waves. It seems that both the dip and hump-like solitary waves can exist in this system. Our results also suggest that the dust-size distribution has a significant role on the amplitude of the solitary waves.

Keywords: Electron-positron-ion-dust plasma; Dust acoustic wave; Solitons; Dust size distribution

Title：**Synchronization of fractional order complex dynamical networks**

Authors： Yu Wang, Tianzeng Li

Sources: *Physica A* ,428 (2015) 1–12 **(A3)**

Abstract： In this letter the synchronization of complex dynamical networks with fractional order chaotic nodes is studied. A fractional order controller for synchronization of complex network is presented. Some new sufficient synchronization criteria are proposed based on the Lyapunov stability theory and the LaSalle invariance principle. These synchronization

criteria can apply to an arbitrary fractional order complex network in which the couplingconfiguration matrix and the inner-coupling matrix are not assumed to be symmetric or irreducible. It means that this method is more general and effective. Numerical simulations of two fractional order complex networks demonstrate the universality and the effectiveness of the proposed method.

Keywords: Synchronization; Fractional order complex network; Lyapunov stability theory

Title：**Convergence Analysis of the Parareal-Euler Algorithm for ODEs Systems with Complex Eigenvalues**

Authors：Shu-Lin Wu

Sources: *Journal of Scientific Computing,* 2015, DOI 10.1007/s10915-015-0100-x **(A2)**

Abstract：Parareal is an iterative algorithm and is characterized by two propagators GG and FF, which are respectively associated with large step size ΔTΔT and small step size ΔtΔt, where ΔT=JΔtΔT=JΔt and J≥2J≥2 is an integer. The choice G=F=G=F=Backward-Euler denotes the simplest implicit parareal solver, which we call Parareal-Euler, and has been studied widely in recent years. For linear problem U′(t)+AU(t)=g(t)U′(t)+AU(t)=g(t) with AA being a symmetric positive definite matrix, this algorithm converges very fast and the convergence rate is insensitive to the change of *J* and ΔtΔt. However, for the case that the spectrum of AA contains complex values, no provable results are available in the literature so far. Previous studies based on numerical plotting show that we can not expect convergence for the Parareal-Euler algorithm on the whole right-hand side of the complex plane. Here, we consider a representative situation: σ(A) ⊆ D(θ):={(x,iy) ∈ C:x≥0,|y|≤tan(θ)x}σ(A) ⊆ D(θ):={(x,iy) ∈ C:x ≥0,|y|≤tan(θ)x} with θ∈(0,π2)θ∈(0,π2), i.e., the spectrum σ(A)σ(A) is contained in a sectorial region. Spectrum distribution of this type arises naturally for semi-discretizing a wide rang of time-dependent PDEs, e.g., the Fokker-Planck equations. We derive condition, which is independent of *J* and depends on θθ only, to ensure convergence of the Parareal-Euler algorithm. Numerical results for initial value and time-periodic problems are provided to support our theoretical conclusions.

Keywords: Parareal algorithm Backward; Euler Convergence analysis Complex eigenvalues

Title：**Convergence analysis of some second-order Parareal algorithms**

Authors：Shu-Lin Wu

Sources: *IMA Journal of Numerical Analysis* ,(2015) 35, 1315–1341 **(A2)**

Abstract：In the past 10 years, the ‘parareal’ (parallel-in-time) algorithm has attracted lots of attention thanks to its excellent performance in scientific computing. The parareal algorithm is iterative and is characterized by two propagators *G* and *F* which are associated

with a coarse step size ΔT and a fine step size Δt, respectively, where $\Delta T = J\Delta t$ and $J \_ 2$ is an integer. When we apply this algorithm to large-scale systems of ordinary differential equations obtained by semidiscretizing partial differential equations, two questions arise naturally. (I) Is the error between the iterate and the target solution contractive at each iteration for any choice of the discretization parameters ΔT, J and Δx? (II) How small can the contraction factor be and can such a contraction factor be independent of the discretization parameters? For linear problems $\mathbf{u}\_ = A\mathbf{u} + g$ with symmetric negative-definite matrix A, when the implicit Euler method is used as both the G- and F-propagators, positive answers to these two questions were given by Mathew *et al.* (2010, *SIAM J. Sci. Comput.*, **32**, 1180–1200) and the contraction factor can be bounded by 0.298 for any choice of the discretization parameters. In this paper, for the case that the implicit Euler method is used as the G-propagator, we provide a positive answer to (I) for three second-order Fpropagators: the trapezoidal method, the TR/BDF2 method and the two-stage diagonally implicit Runge–Kutta (2s-DIRK) method. For (II), we prove that the contraction factors can be bounded by 0.316 and 13 for the 2s-DIRK method and the TR/BDF2 method (provided the parameter γ involved in TR/BDF2 satisfies $\gamma \in [0.043, 0.977]$), respectively, and both bounds are independent of the discretization parameters. For the trapezoidal method, we show that a uniform bound (less than 1) of the contraction factor does not exist. Numerical results are presented to validate the theoretical prediction.

Keywords: parareal algorithm; implicit Euler method; TR/BDF2 method; trapezoidal method; 2s-DIRK method.

Title: **Convergence analysis of Three Parareal Solvers**

Author: SHU-LIN WU, TAO ZHOU

Sources: *SIAM Journal of Scientific Computing*, 2015, 37(2):A970–A992 **(A2)**

Abstract: We analyze in this paper the convergence properties of the parareal algorithm for the symmetric positive definite problem $\mathbf{u}\_ + A\mathbf{u} = g$. The coarse propagator G is fixed to the backward-Euler method and three time integrators are chosen for the F-propagator: the trapezoidal rule, the third-order diagonal implicit Runge‐Kutta (RK) (DIRK) method, and the fourth-order Gauss RK method. It is well known that the Parareal-Euler algorithm using the backward-Euler method for F and G converges rapidly, but less is known when one uses for F the trapezoidal rule, or the fourthorder Gauss RK method, especially when the mesh ratio $J(= \Delta T/\Delta t)$ is small. We show that for a specified λmax(the maximal eigenvalue of A or its upper bound), there exists some critical Jcri such that the parareal solvers derived from these three choices of F converge as fast as Parareal-Euler, provided $J \geq J$cri. Precisely, for F the trapezoidal rule and the fourth-order Gauss RK method, Jcri depends on $\Delta T, \Delta t$, and λmax and we present concise formulas to calculate Jcri, while for F the third-order DIRK method, Jcri = 4, independently of these parameters. Numerical

examples with applications in fractional PDEs and uncertainty quantification are presented to support the theoretical predictions.

Keywords: parareal algorithm, SPD problems, time-dependent PDEs, trapezoidal rule, thirdorder DIRK method, fourth-order Gauss Runge – Kutta method

Title: **On general system of generalized quasi-variational-like inclusions with maximal η-monotone mappings in Hilbert spaces**

Author: Ting-jian Xiong, Heng-you Lan

Sources: *J. COMPUTATIONAL ANALYSIS AND APPLICATIONS, 2015*,18(3):506-514 **(A4)**

Abstract: In this paper, we consider a new general system of generalized quasivariational-like inclusions in Hilbert spaces. We suggest a new iterative algorithm for finding an approximate solution to the generalized quasi-variational-like inclusion systems, and prove the convergence of the iterative sequence generated by the algorithm. The presented results improve and extend some known results.

Keywords: General system of generalized quasi-variational-like inclusion, maximal η -monotone mapping, iterative algorithm, existence, convergence criteria.

Title: **A simple method to obtain the stochastic decomposition structure of the busy period in Geo/Geo/1/N vacation queue**

Author: Miaomiao Yu, Attahiru Sule Alfa

Sources: *J 4OR-Quaterly Journal Operations Research,* (2015) 13:361–380 **(A4)**

Abstract: In this paper, some tips and tricks for algebraicmanipulations are utilized to explicitly get themean and variance of the duration of the busy period in a discrete-time finite-buffer vacation queue. Applying the law of total expectation, the closed-form expressions for the first two moments of the busy period initiated with an arbitrary number of customers are firstly derived. Then, by employing the queue length distribution at vacation termination and the quantities that mentioned above, we give the stochastic decomposition structure of the busy period. Finally, in order to ensure the reliability of the analytical approach, an effective way to validate the correctness of our results along with a numerical example is also provided. We may find that these simple tips and tricks can greatly reduce the difficulty of problem solving.

Keywords: Discrete-time queue; Finite-buffer; Vacation; Busy period; Stochastic decomposition structure

Title: **Algorithm for computing the queue length distribution at various time epochs in DMAP/G(1,a,b)/1/N queue with batch-size-dependent**

Author: Miaomiao Yu, Attahiru Sule Alfa

Sources: *European Journal of Operational Research,* 244 (2015) 227–239 **(A2)**

Abstract: This paper presents a discrete-time single-server finite-buffer queue with Markovian arrival process and generally distributed batch-size-dependent service time. Given that infinite service time is not commonly encountered in practical situations, we suppose that the distribution of the service time has a finite support. Recently, a similar continuous-time system with Poisson input process was discussed by Banerjee and Gupta (2012). But unfortunately, their method is hard to apply in the analysis of discrete-time case with versatile Markovian point process due to the fact that the difference equation governing the boundary state probabilities is more complex than the continuous one. If we follow their ideas, we will eventually find that some important joint queue length distributions cannot be computed and thus some key performance measures cannot be derived. In this paper, replacing the finite support renewal distribution with an appropriate phase-type distribution, the joint state probabilities at various time epochs (arbitrary, pre-arrival and departure) have been obtained by using matrix analytic method and embedded Markov chain technique. Furthermore, UL-type RG-factorization is employed in numerical computation of block-structured Markov chains with finitely-many levels. Some numerical examples are presented to demonstrate the feasibility of the proposed algorithm for several service time distributions. Moreover, the impact of the correlation factor on loss probability and mean sojourn time is also investigated.

Keywords: Queueing; Batch-size-dependent service; Markovian arrival process; Phase-type distribution; Finite-buffer

Title: **A Convergence Study of Multisubdomain Schwarz Waveform Relaxation for a Class of Nonlinear Problems**

Author: Liping Zhang , Shu-LinWu

Sources: *Mathematical Problems in Engineering,* Volume 2015, Article ID 612862 **(A3)**

Abstract: Schwarz waveform relaxation (SWR) is a new type of domain decomposition methods, which is suited for solving time-dependent PDEs in parallel manner. The number of subdomains, namely, , has a significant influence on the convergence rate. For the representative nonlinear problem , convergence behavior of the algorithm in the two-subdomain case is well-understood. However, for the multisubdomain case (i.e.,), the existing results can only predict convergence when . Therefore, there is a gap between and . In this paper, we try to finish this gap. Precisely, for a specified subdomain number , we find that there exists a quantity such that convergence of the algorithm on unbounded time domains is guaranteed if . The quantity depends on and we present concise formula to calculate it. We show that the analysis is useful to study more complicated PDEs. Numerical results are provided to support the theoretical predictions.

Title: **一般支撑条件下横向流中弹性圆柱的响应**

Author: 李云东,杨翊仁,李鹏

Sources: *工程力学*, 2015, 32 (2): 227-232 **(A5)**

Abstract: 该文以横向流方形圆柱阵中的单根、两端带有一般支撑条件圆柱的流致振动现象进行研究。考虑圆柱的横向变形及其对轴力的影响,建立了系统动力学方程。分析了系统的稳定性及在不同流速条件下出现的复杂非线性行为,该文以分岔图、相平面图、庞加莱映射图来刻画流速变化对圆柱振动的影响。研究结果表明,系统的初始预应力,降低了圆柱的稳定性;当流速较小时,系统首先表现为周期运动;随着流速增大,系统进入概周期运动,该系统未发生混沌运动。

Keywords: 圆柱阵, 流致振动, 概周期, 分岔, 庞加莱映射

Title: **On the validity of Thompson's conjecture for alternating groups Ap+4 of degree p+4**

Author: YAGN YONG,SHITIAN LIU

Sources: *WSEAS TRANSACTIONS on MATHEMATICS*, 2015, Volume 14 **(A5)**

Abstract: Let G be a group. Let $\pi(G)$ be the set of prime divisor of $|G|$. Let $GK(G)$ denote the graph with vertex set $\pi(G)$ such that two primes p and q in $\pi(G)$ are joined by an edge if G has an element of order $p \cdot q$. We use $s(G)$ to denote the number of connected components of the prime graph $GK(G)$. Let $N(G)$ be the set of nonidentity orders of conjugacy classes of elements in G. Some authors have proved that the groups An where $n = p, p + 1, p + 2$ with $s(G) \geq 2$, are characterized by $N(G)$. Then if $s(G) = 1$, we know that Liu and Yang proved that alternating groups Ap+3 are characterized by $N(G)$. As the development of this topics, we will prove that if G is a finite group with trivial center and $N(G) = N(Ap+4)$ with $p + i$ composite and $1 \leq i \leq 4$, then G is isomorphic to Ap+4.

Keywords: Element order, Alternating group, Thompson's conjecture, Conjugacy classes, Simple group.

Title: **Secure and efficient fine-grained data access control scheme in cloud computing**

Authors: Changsong Yang, Jun Ye*

Sources: *Journal of High Speed Networks* ,21 (2015) 259–271 **(A5)**

Abstract: Cloud computing, which provides quite inexpensive and dynamically scalable computing services via network and communication infrastructures, is increasingly important for future information and communication technologies. At the same time, it brings many new challenges for data security and access control when sensitive data are shared and stored on cloud servers. To protect the data privacy, cryptographic methods are usually used. Attribute-based encryption is a good way to implement access control. However, in practical application, efficiency of attribute-based encryption schemes is rather low due to a large number of algebraic operations. Thus, it is very important to

improve efficiency of user addition/revocation and file re-encryption. In this paper we introduce an improved data access control scheme based on attribute-based encryption. Our scheme significantly improves the efficiency of adding and revoking user access to the cloud.

Keywords: Efficiency, access control, attribute-based encryption, cloud computing

Title: **Completely continuous composition operators on Orlicz spaces**

Author: Zhijie Jiang

Sources: *数学进展*,2015,44(1):111-116 **(B)**

Abstract: 设φ:X→X是非奇异变换,Ψ是Orlicz函数,(X,Σ,μ)是完备的σ-有限测度空间.本文利用Radon-Nikodym导数($d\mu\circ\phi^{-1}$)/dμ刻画了Orlicz空间上紧的复合算子C_{ϕ},同时给出了该空间上有界复合算子完全连续的充要条件.

Keywords: ORLICZ函数; ORLICZ空间; 复合算子; 完全连续性

Title: **Σ(X)上权移位算子的一致分布混沌和准测度**

Author: 卢天秀，朱培勇，吴新星

Sources: *应用数学学报*, 2015, 38(1):1-7 **(B)**

Abstract: 设X为赋范线性空间(不一定完备),Σ(X)=X~N0.本文证明:对于任意0 ε diamΣ(X)=2,权移位算子B_w:Σ(X)→Σ(X),(x_0,x_1,⋯)→(w_0x_1,w_1x_2,⋯)B_w是分布ε-混沌的,并且其准测度等于1.同时,该性质在迭代运算下是保持的.

Keywords: 权移位算子； 一致分布混沌； 准测度

Title: **满旗流形*SO*(8)=*T*上不变爱因斯坦度量**

Author: 王瑜, 李天增

Sources: *数学杂志*, 2015, 35(6):1319-1328 **(C)**

Abstract: 本文研究了迷向表示分为 12 个不可约子空间的满旗流形 $SO(8)=T$ 上不变爱因斯坦度量的问题. 利用计算机计算满旗流形 $SO(8)=T$ 爱因斯坦方程组的方法, 得到了满旗流形 $SO(8)=T$ 上有 160 个不变爱因斯坦度量(up to a scale)的结果, 在等距情况下考虑这 160 个不变爱因斯坦度量, 其中 1 个是凯莱爱因斯坦度量, 4 个是非凯莱爱因斯坦度量. 推广了只对迷向表示分为小于等于 6 个不可约子空间的满旗流形上不变爱因斯坦度量的研究.

Keywords: 满旗流形; 爱因斯坦度量; Ricci 张量; 迷向表示

Title: **Stationary Analysis of Geo/Geo/1 Queue with Two-Speed Service and the Optimal Switching Threshold for the Service Rate**

Author: Xudong Lin

Sources: *Applied Mathematics*, 2015, 6, 908-921 **(D)**

Abstract: This paper considers a Geo/Geo/1 queueing system with infinite capacity, in which the service rate changes depending on the workload. Initially, when the number of customers in the system is less than a certain threshold *L*, low service rate is provided for cost saving. On the other hand, the high service rate is activated as soon as *L* customers accumulate in the system and such service rate is preserved until the system becomes completely empty even if the number of customers falls below *L*. The steady-state probability distribution and the expected number of customers in the system are derived. Through the first-step argument, a recursive algorithm for computing the first moment of the conditional sojourn time is obtained. Furthermore, employing the results of regeneration cycle analysis, the direct search method is also implemented to determine the op-timal value of *L* for minimizing the long-run average cost rate function.

Keywords: Workload-Dependent Service, Switching Threshold, Discrete-Time Queue, Sojourn Time, Regeneration Cycle

Title: **nse characterization of projective special unitary group U3(8)**

Author: Shitian Liu, Yong Yang

Sources: *Int. J. Appl.Math. Stat., 2*015, 53(2):132-140 **(D)**

Abstract: Let G be a group and $\omega(G)$ be the set of element orders of G. Let $k \in \omega(G)$ and s_k be the number of elements of order k in G. Let nse $(G) = \{s_k : k \in \omega(G)\}$. In this paper, we prove that if G is a group, then $G \cong U_3(8)$ if and only if nse(G)=nse $U_3(8)$.

Keywords: element order, projective special linear group, Thompsons problem, number of elements of the same order.

Title: **A characterization of alternating group A28 by conjugate class sizes**

Author: Shitian Liu

Sources: *Journal of Applied sciences*, 2015, 15(3):588-592 (D)

Abstract: For a group, let N(G):{n| conjugate class sizes of order n in G}. The groups Ap+3, Ap+4 are characterized by N(G) only. If 5 · p belong to the set of element orders of G, then whether are the alternating groups Ap+5 characterized by N(G). In this study, finite simple classification theorem and the properties of the set N(G) was used to characterize alternating group A28, namely, we will prove that if G is a finite group with trivial center and N(G) = N(A28), then G is isomorphic to A28.

Keywords: alternating group; thompson's problem; conjugate class size; simple group;Element order

Title: **非自治离散系统的分布混沌性**

Author: 卢天秀，朱培勇，吴新星

Sources: *数学物理学报*, 2015, 5A(3):558-566 **(D)**

Abstract: 该文在非自治离散系统中定义了分布混沌,研究了映射序列fn,∞=（fn,fn＋t,…）,A↓n∈N（N为自然数集）的混沌行为,讨论了fn,∞的分布混沌性是否意味着乘积系统fn,∞^[m]（m为正整数）的分布混沌性,或者后者的分布混沌性是否意味着前者的分布混沌性.

Keywords: 非自治离散系统；分布混沌；乘积映射

Title: **广义旗流形 SU(5)/U3(1)*SU(2) 齐性变爱因斯坦度量**

Author: 王瑜，贾红艳，李天增

Sources: *河南大学学报（自然科学版）*, 2015,45(1):15-20 **(D)**

Abstract: 利用李代数的知识可以计算旗流形M=SU（5）/U3（1）×SU（2）上非零的结构常数ckij,然后把非零的ckij代入Ricc张量的分量γ1,…,γ6.旗流形M上G不变的黎曼度量g是爱因斯坦度量当且仅当存在正常数e,使得γ 1=γ2=γ 3=γ4=γ5=γ6=e.利用计算Gr（o）bner基的方法得到爱因斯坦方程组有27个正的实数解,即广义旗流形M=SU（5）/U3（1）×SU（2）上有27个不变的爱因斯坦度量（在差常数倍的情况下）,其中12个是凯莱爱因斯坦度量,15个是非凯莱爱因斯坦度量。

Keywords: 广义旗流形；爱因斯坦度量； Ｒｉｃｃｉ张量；迷向表示

Title: **A class of Z4C-groups**

Authors： Jinshan Zhang

Sources: *Applied Mathematical Sciences*, 2015, 9(41): 2031 -2035 (D)

Abstract: The aim of this note is to classify a class of _nite solvable groups whose every irreducible character vanish on at most four conjugacy classes in the character table.

Title: **A on the orders of zeros of monolithic characters**

Authors： Jinshan Zhang, Dandan Liu, Guangju Zeng

Sources: *South Asian Journal of Mathematics*, 2015 , 5 (1) : 32-34 **(D)**

Abstract: A character _ of a group G is said to be a monolithic character if _ ∈ Irr(G) and the factor group G/ker(_) contains only one minimal normal subgroup. We say that an element g in G is a M-vanishing element of G if there exists a monolithic character _ of G such that _(g) = 0. The main result of this paper shows that, for a fixed prime number p, if G is a finite solvable group and G does not have any M-vanishing element of p-power order, then G has a normal Sylow p-subgroup. Our result is a generalization of the solvable part of Theorem A in [1].

Keywords: finite groups, characters, zeros of characters