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Part I Conference Schedule

Time: February 26- 28, 2017

Location: International Asia-Pacific Convention Center Sanya
 三亚亚太国际会议中心暨三亚海航度假酒店

Date	Time	Lobby	
Feb. 26	14:00-17:00	Registration	
Date	Time	Tokyo Room(东京厅)	Macao Room(澳门厅)
Feb. 27	08:30-12:00	ISCAM 2017 Invited Session 1 & Technical Session 1: Chair: Dr. Xuefeng Li Group photo & Coffee Break: 10:00-10:20	Geology Series Invited Session Chair: Group photo & Coffee Break: 10:00-10:20
	12:00-13:30	Lunch Pacific Cafe (太平洋咖啡厅)	
Date	Time	Tokyo Room(东京厅)	Macao Room(澳门厅)
Feb. 27	14:00-18:00	ISCAM 2017 Invited Session 2 & Technical Session 2: Chair: Prof. Melusi Khumalo Group photo & Coffee Break: 16:15-16:30	Geology Series Technical Session Chair: Dr. Ya-juan Xue Group photo & Coffee Break: 16:15-16:30
	18:00-19:30	Dinner Pacific Cafe (太平洋咖啡厅)	
Date	Time	Tokyo Room(东京厅)	
Feb. 28	08:30-12:00	ISCAM 2017 Invited Session 3 & Technical Session 3: Chair: Group photo & Coffee Break: 10:00-10:15	
	12:00-13:30	Lunch Pacific Cafe (太平洋咖啡厅)	

Part II Invited Speech

2017 International Symposium on Computational and Applied Mathematics (ISCAM 2017)

Invited Speech: Some Lattice-Ordered Algebras With The Strong

Endomorphism Kernel Property

Speaker: Prof. Jie Fang, Guangdong Polytechnic Normal University, China

Time: 08:30-09:15, Monday Morning, February 27, 2017

Location: Tokyo Room(东京厅), 3rd Floor, Conference Building, International Asia-Pacific Convention Center Sanya



Abstract

In 2001, an open question that was posed by Blyth, Silva and Varlet in [2] is the following: for an Ockham algebra L determine the congruences on L that are kernels of endomorphisms on L . Whereas a general solution to this is still an open problem, there has been some progress in investigating kernels of endomorphisms in various lattice-ordered algebras. In this connection, an algebra A is said to have the endomorphism kernel property if every congruence on A , other than the universal congruence, is a kernel of an endomorphism on A . A strengthening of this notion was given by Blyth and Silva [6] in the context of Ockham algebras. Specifically, if A is an algebra and $\#$ is a congruence on A then an endomorphism e on A is said to be compatible with $\#$ if $(x; y \in A) (x; y \in \#) \Rightarrow (e(x); e(y)) \in \#$: If such an endomorphism e is compatible with every congruence on A then it is said to be strong. Then A is said to have the strong endomorphism kernel property if every congruence on A , other than the universal congruence, is the kernel of a strong endomorphism on A . In [6], Blyth and Silva investigated Ockham algebras with the strong endomorphism kernel property by way of Priestley duality. They particularly showed that if L is an MS-algebra with dual space X that has the strong endomorphism kernel property then X can be characterized in terms of 1-point compactifications of discrete spaces. A similar approach adopted in some lattice-ordered algebras such as distributive p -algebras, distributive double p -algebras and double MS-algebras. By a direct algebraic way, the class of Heyting algebras and class of semilattices with this property also can be characterised. We recall that a Priestley space is a compact totally order-disconnected topological space. For a Priestley space X , we shall denote by $O(X)$ the set of all clopen down-sets of X . Then $O(X)$ is a distributive lattice. Conversely, if L is a distributive lattice, then $(X; \leq; \tau)$ is a Priestley space, where $X = \text{Ip}(L)$ is the lattice of prime ideals of L and the topology τ has as a base the sets $\{x \in \text{Ip}(L) \mid x \not\supseteq a\}$ and $\{x \in \text{Ip}(L) \mid x \supseteq a\}$. These constructions give that $L \cong O(\text{Ip}(L))$ and $X \cong \text{Ip}(O(X))$. The power of duality theory is particularly evident in the study of congruence relations. If L is a distributive lattice and X is the dual space of L then for every closed subset Q of X the relation \equiv_Q defined on $O(X)$ by $(A; B) \equiv_Q () A \setminus Q = B \setminus Q$ is a congruence. Moreover, the lattice of congruences on L is dually

iso- morphic to the lattice of closed subsets of X .

Invited Speech: MIMO Mutual Information Computation and Pareto Optimality of Scheduling Game by Reflecting SDEs

Speaker: Prof. Wanyang Dai, Nanjing University, China

Time: 09:15-10:00, Monday Morning, February 27, 2017

Location: Tokyo Room(东京厅), 3rd Floor, Conference Building, International Asia-Pacific Convention Center Sanya



Abstract

We first introduce a unified system of stochastic differential equations (SDEs) with skew reflections and then prove the existence and uniqueness of its solution in strong or weak sense. Based on this unified system, we derive a generalized mutual information computation formula to determine the signal processing capacity over possible non-Gaussian channels with multi-input multi-output (MIMO) antennas. The channels are proposed to serve multiple competing users (game players) under a Pareto maximal-utility Nash equilibrium resource allocation algorithm (policy) myopically at each time point, which is proven to be an asymptotic Pareto minimal-dual-cost Nash equilibrium policy globally over the whole time horizon. In other words, the policy is fair to all the players and in the meanwhile it is optimal to the whole game system. Furthermore, certain reflecting SDE is proved to be the effective performance model for the scheduling policy both theoretically and numerically. Applications of our studies in intelligent cloud-computing systems for big-data services will also be mentioned.

Invited Speech: On the Bruck's Ergodic Iteration Method for Solving the Ky

Fan Inequalities

Speaker: Prof. Jong Kyu Kim, Kyungnam University, Republic of Korea

Time: 10:20-11:05, Monday Morning, February 27, 2017

Location: Tokyo Room(东京厅), 3rd Floor, Conference Building, International Asia-Pacific Convention Center Sanya



Abstract

We introduce a new iteration algorithm for solving the Ky Fan inequality over the fixed point set of a nonexpansive mapping, where the cost bifunction is monotone without Lipschitz-type continuity. The algorithm is based on the idea of the ergodic iteration method for solving multi-valued variational inequality which is proposed by Bruck and the auxiliary problem principle for equilibrium problems. By choosing suitable regularization parameters, we also present the convergence analysis in detail for the algorithm and give some illustrative examples.

Keyword: Ky Fan inequalities, monotonicity, fixed points, nonexpansive mappings.

Invited Speech: A New Computational Method for the Sparse Point of Polyhedral Sets

Speaker: Prof. Yunbin Zhao, University of Birmingham, UK

Time: 14:00-14:45, Monday Afternoon, February 27, 2017

Location: Tokyo Room(东京厅), 3rd Floor, Conference Building, International Asia-Pacific Convention Center Sanya



Abstract

The L₀-minimization seeking the sparsest point of a polyhedral set is a long-lasting challenging problem in the fields of sparse signal recovery, statistical and machine learning, linear algebra and operations research. The weighted or reweighted L₁-minimization method is one of the most plausible methods for sparsity-seeking problem. We develop a novel of such method through the fundamental complementarity theory of linear optimization. Specifically, we first prove that finding the sparse point in a polyhedron can be reformulated as the equivalent problem of seeking the corresponding densest slack variable of the dual problem of some weighted L₁-problem. This theoretical observation provides a new perspective to understand the NP-hard L₀-minimization, and it also provides a strong incentive to develop a new computational method, which is remarkably different from many existing sparsity-seeking methods. The weight used in our algorithm is computed via solving a convex optimization, instead of being defined directly and locally through the current iterate. Subject to suitable conditions, we rigorously show that our algorithm is globally convergent to the sparse point of the polyhedral set. The efficiency of the algorithm has been demonstrated by empirical simulations.

Invited Speech: On Moment Problems in Robust Control, Spectral Estimation, Image Processing and System Identification

Speaker: Prof. Anders Lindquist, Shanghai Jiao Tong University, China

Time: 14:45-15:30, Monday Aftrenoon, February 27, 2017

Location: Tokyo Room(东京厅), 3rd Floor, Conference Building, International Asia-Pacific Convention Center Sanya



Abstract

Moment problems are ubiquitous in both mathematics and engineering. Such inverse problems are typically underdetermined and give rise to families of particular solutions. Therefore finding a solution that also satisfies a natural optimality

criterion and additional design specifications is an important general problem in engineering. Many problems in circuit theory, power systems, robust control, signal processing, spectral estimation, statistical modeling, image processing and identification lead to a non-classical version of the moment problem, reflecting the importance of rational functions in engineering applications. Although this version of the problem is nonlinear, there exists a natural, universal family of strictly convex optimization criteria defined on the convex set of particular solutions. This provides a powerful paradigm for smoothly parameterizing, comparing and shaping the solutions based on various additional design criteria and enables us to establish the smooth dependence of solutions on problem data.

Invited Speech: FIXED POINT THEORY FOR DIGITAL SPACES

ASSOCIATED WITH KHALIMSKY AND MW-TOPOLOGY

Speaker: Prof. Sang-Eon Han, Chonbuk National University, Republic of Korea

Time: 15:30-16:15, Monday Aftrenoon, Fenruary 27, 2017

Location: Tokyo Room(东京厅), 3rd Floor, Conference Building, International Asia-Pacific Convention Center Sanya



Abstract

In this talk, we studies the fixed point theory and the almost fixed point theory from the viewpoint of digital topology associated with Khalimsky and Marcus-Wyse topology. Based on a digital version of the Banach contraction principle [1], in digital topology, we say that a digital image (X, k) has the fixed point property if every k -continuous map $f : (X, k) \rightarrow (X, k)$ has a fixed point $x \in X$, i.e. $f(x) = x$. Motivated by the formal research into the fixed point property, we have some intrinsic features in digital digital versions of both fixed point property and the almost fixed point property [1, 2, 3, 4, 5, 6, 7]. This approach can be used in certain areas in both computer science and applied sciences.

References

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Invited Speech: Fuzzy Inner Product and Fuzzy Norm of Hyperspaces

Speaker: Prof. Reza Ameri, University of Tehran, Iran

Time: 08:30-09:15, Tuesday Morning, February 28, 2017

Location: Tokyo Room(东京厅), 3rd Floor, Conference Building,
International Asia-Pacific Convention Center Sanya



Abstract

Let K be a field and $(V, +)$ be an abelian group. A hyperspace over K is as a quadruple $(V, +, \circ, K)$, where \circ is a multivalued mapping $\circ : K \times V \rightarrow P^*(V)$ (the set of all nonempty subsets of V) that satisfies the axioms similar to a vector space. In this regards we introduce and study the notions of fuzzy hyperspaces, fuzzy inner product and fuzzy norm of hyperspaces, as generalization of fuzzy vector spaces, and fuzzy inner product, fuzzy norm of vector spaces. We will proceed to formulating the notions of fuzzy norm and fuzzy orthogonality as well as fuzzy Banach hyperspaces. In particular, it is proved that to every fuzzy hyperspace associated a unique fuzzy inner product hyperspace in a natural way some basic results of such fuzzy hyperspaces are obtained.

Key words and phrases: fuzzy hyperspace, fuzzy inner product, fuzzy norm, fuzzy Banach space.

References

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Invited Speech: On the Annihilator Graph of A Commutative Ring

Speaker: Prof. Ayman Badawi, American University of Sharjah, United Arab Emirates

Time: 09:15-10:00, Tuesday Morning, February 28, 2017

Location: Tokyo Room(东京厅), 3rd Floor, Conference Building, International Asia-Pacific Convention Center Sanya



Abstract

Let R be a commutative ring with nonzero identity, $Z(R)$ be its set of zero-divisors, and if $a \in Z(R)$, then let $\text{ann}(a) = \{d \in R \mid da = 0\}$. The annihilator graph of R is the (undirected) graph $AG(R)$ with vertices $Z(R)^* = Z(R) \setminus \{0\}$, and two distinct vertices x and y are adjacent if and only if $\text{ann}(xy) \neq \text{ann}(x) \cup \text{ann}(y)$. It follows that each edge (path) of the classical zero-divisor graph of R is an edge (path) of $AG(R)$. In this paper, we study the graph $AG(R)$. For a commutative ring R , we show that $AG(R)$ is connected with diameter at most two and with girth at most four provided that $AG(R)$ has a cycle. Among other things, for a reduced commutative ring R , we show that the annihilator graph $AG(R)$ is identical to the classical zero-divisor graph of R if and only if R has exactly two minimal prime ideals.

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Invited Speech: Improved Teaching-Learning-Based Optimization Metaheuristic for Multiple-Choice Multidimensional Knapsack Problems

Speaker: Prof. Yun (Amy) Lu, Kutztown University of PA, USA

Time: 10:15-11:00, Tuesday Morning, February 28, 2017

Location: Tokyo Room(东京厅), 3rd Floor, Conference Building, International Asia-Pacific Convention Center Sanya



Abstract

In this paper, we improve the performance of the teaching-learning-based optimization (TLBO) method by introducing 'teacher training' before the teaching phase of TLBO. That is, before the teaching phase of TLBO, we perform a local neighbourhood search on the best solution (the teacher) in the current population. The effectiveness of teacher training (TT) in terms of both solution quality and convergence rate will be demonstrated by using this approach (TT-TLBO) to solve a large (393) number of problem instances from the literature for the important (NP-Hard) multiple-choice multidimensional knapsack problem (MMKP). Furthermore, we will demonstrate that TLBO outperforms the best published solution approaches for the MMKP.

Geology Series

Invited Speech: Approaches for Assessing Values of Afforestation on Hydrology

Restoration and Water Quality Improvement in the Lower Mississippi River

Alluvial Valley, USA

Speaker: Prof. Ying Ouyang, USDA Forest Service, USA

Time: 08:30-09:15, Monday Morning, February 27, 2017

Location: Macao Room(澳门厅), 3rd Floor, Conference Building,
International Asia-Pacific Convention Center Sanya



Abstract

Changes in forest and agricultural practices, clearcutting in bottomland hardwood forests, and conversions from forests to agricultural lands are largely responsible for poor hydrological conditions, flood control loss and water quality degradation in the Lower Mississippi River Alluvial Valley (LMRAV) and its adjacent Gulf of Mexico in USA. Although several efforts, including pilot scale and paired-watershed studies, have been devoted to investigating the ecological, hydrological, and environmental benefits of forest managements, the functions and values of afforestation in the LMRAV on hydrology restoration, flood attenuation, and water quality improvement are still poorly documented. Since the dynamics of forest conditions, hydrological cycles, contaminant loads, and surficial processes are complex processes, it is very difficult (if not impossible) to quantify them by experimentation alone for a variety of forest species, for different contaminants and hydrological conditions, and for all possible combinations of surficial processes. The goal of this study is to assess the functions and values of afforestation upon hydrology restoration and water quality improvement in the LMRAV using computational methods in conjunction with field experiments. The specific objectives and approaches are to: (1) to assess how afforestation affects hydrological process, flood attenuation, sediment erosion, and contaminant load in selected watersheds within the LMRAV using BASINS-HSPF model; (2) identify temporal patterns of stream flow and sediment/contaminant between the afforested watershed and the agricultural watershed in the LMRAV using wavelet

analysis technique; and (3) estimate peak flow and sediment load trends between the afforested watershed and the agricultural watershed in LMRAV using the duration curve/frequency distribution analysis technique. This study demonstrates that the HSPF model, wavelet analysis technique, and duration curve/frequency distribution analysis tools are useful approaches for estimating the functions and values of afforestation upon hydrology restoration and water quality improvement in watersheds. Although the approaches are used for the LMRAV, they can be transferred to other regions in the world.

Invited Speech: Ordovician Williston Basin of North America: what new can we learn from the old petroleum plays?

Speaker: Dr. Antun Husinec, St. Lawrence University, USA

Time: 09:15-10:00, Monday Morning, February 27, 2017

Location: Macao Room(澳门厅), 3rd Floor, Conference Building, International Asia-Pacific Convention Center Sanya



Abstract

Despite the abundance of Paleozoic epeiric sea carbonates and vast research on various aspects of their stratigraphy, sequence stratigraphic, chemostratigraphic and diagenetic studies of mixed carbonate-evaporite cratonic successions are relatively scarce. The Williston Basin of North America is a large interior cratonic basin underlying the great plains of North Dakota, South Dakota, Montana, Saskatchewan, and Manitoba. The Williston Basin province contains ten petroleum systems, with 13 conventional and six unconventional assessment units spanning the Upper Cambrian through Tertiary. During the Late Ordovician, oceanic communication with the Williston Basin was periodically limited, which during sea-level lows and under a tropical semi-arid climate resulted in the development of basin-central evaporitic units as parts of shallowing and brining-upward, anhydrite-bound sequences of the Red River Formation, the 2nd major conventional reservoir in the basin. Sequences record a change from semi-arid transgressive (TST) and early highstand (HST) to arid late highstand (HST) and lowstand systems tracts (LST). The small number of parasequences (3-15 per sequence) and their durations are suggestive of eccentricity and obliquity forcing, which is compatible with transitional eustasy during the Late Ordovician global cooling and further suggests the existence of moderate ice sheets and the onset of icehouse conditions in Late Ordovician. In the absence of ocean floor sediments, the epeiric sea carbonates are the major recorders of the Paleozoic global carbon cycle. However, the restricted circulation coupled with local (regional) environmental influences can result in geographic variations in C-isotope record, and possibly excursions that are unrelated to the pelagic surface ocean. Deep burial commonly results in multiple replacement episodes of metastable, early formed dolomite crystals by later, more stable phases. This also may reset the stable isotope signature of dolomite at progressively higher temperatures. Although deeply buried (up to 4.9 km), the Upper Ordovician dolomites of the Williston Basin, for the most part, exhibit no multiple events of post-depositional recrystallization, and both dolomite and limestone have similar carbon-isotope values, suggesting that carbon was rock buffered, and could be representing the original marine C-isotope record. This

further suggests that the Upper Ordovician mixed carbonate-evaporite Red River Fm. of the Williston Basin provides a superb example of a large, periodically isolated evaporitic basin in which the carbon isotope signal has been greatly influenced primarily by local (regional) environmental conditions, and stabilized by later burial diagenesis, but without greatly resetting the original reflux dolomite petrography.

Invited Speech: Future potential hydrocarbon plays in the Arabian Basin

Speaker: Dr.Fadhil N. Sadooni, Qatar University, Qatar

Time: 10:20-11:05, Monday Morning, Fenruary 27, 2017

Location: Macao Room(澳门厅), 3rd Floor, Conference Building, International Asia-Pacific Convention Center Sanya



Abstract

The Arabian basin is the richest hydrocarbon province in the world hosting more than 67% of the world's oil reserve. A fortunate combination of rich source rocks, excellent carbonate reservoirs and a good timing of oil migration and tectonism provided the needed traps to store these huge reserves. The Basin provided the world with its energy since the drilling of the Masjid Sulaiman Field in Iran in 1908 by the Anglo-Turkish Company. The Arabian Basin, however, may still have more hydrocarbon deposits after a century full of exploration activities. There are new oil and gas plays that need to be drilled and evaluated. Among the future potential oil and gas potential reservoirs in the region are the Paleozoic clastics all over the basin (Ordovician porous sand associated with the hot Silurian shale) as indicated by the exploration work in Iraq, Kuwait, Saudi Arabia and Oman. The Triassic carbonate-evaporite successions proved to be a rich new oil system in the northern parts of the Arabian Plate extending through Iraq, Syria, the Levant and even within the Mediterranean offshore areas. Stratigraphic entrapments in the Cretaceous rudist buildups, the mud mounds, the intertidal dolomites all these represent new plays that need to be evaluated and drilled. In our view, the Arabian Basin still have many pleasant surprises for the future.

Invited Speech: TBD

Speaker: Dr. Javed Iqbal, Abbottabad University of Science and Technology, Pakistan

Time: 11:05-11:50, Monday Morning, Fenruary 27, 2017

Location: Macao Room(澳门厅), 3rd Floor, Conference Building, International Asia-Pacific Convention Center Sanya



Abstract

TBD

Part III Technical Sessions

ISCAM 2017: Invited Session 1 & Technical Session 1

Session Chair: Dr. Xuefeng Li, LOYOLA UNIVERSITY NEW ORLEANS, USA

Tokyo Room(东京厅), 3rd Floor, Conference Building

08:30-12:00, Monday Morning, February 27, 2017

ID	Paper Title	Author	Affiliation
VIP	SOME LATTICE-ORDERED ALGEBRAS WITH THE STRONG ENDOMORPHISM KERNEL PROPERTY	Prof. Jie Fang	Guangdong Polytechnic Normal University, China
VIP	MIMO Mutual Information Computation and Pareto Optimality of Scheduling Game by Reflecting SDEs	Prof. Wanyang Dai	Nanjing University, China
10:00-10:20	Coffee Break		
VIP	On the Bruck's Ergodic Iteration Method for Solving the Ky Fan Inequalities	Prof. Jong Kyu Kim	Kyungnam University, Republic of Korea
11:05-11:25	The leader-following consensus for discrete-time linear multi-agent systems subject to directed switching graphs	Jie Huang	Chinese University of Hong Kong
11:25-11:45	On Chorded Pancyclic Graphs	Kazuhide Hirohata	National Institute of Technology, Ibaraki College, Japan
11:45-12:05	Augmented Lagrangian Methods for Numerical Solutions to Higher Order Differential Equations	Xuefeng Li	LOYOLA UNIVERSITY NEW ORLEANS, USA

ISCAM 2017: Invited Session 2 & Technical Session 2

Session Chair: Prof. Melusi Khumalo, University of Johannesburg, South Africa

Tokyo Room(东京厅), 3rd Floor, Conference Building
2017

14:00-18:00, Monday Afternoon, February 27,

ID	Paper Title	Author	Affiliation
VIP	A new computational method for the sparse point of polyhedral sets	Prof. Yunbin Zhao	University of Birmingham, UK

VIP	On Moment Problems in Robust Control, Spectral Estimation, Image Processing and System Identification	Prof. Anders Lindquist	Shanghai Jiao Tong University, China
VIP	Improved Teaching-Learning-Based Optimization Metaheuristic for Multiple-Choice Multidimensional Knapsack Problems	Prof. Yun (Amy) Lu	Kutztown University of PA, USA
16:15-16:30	Coffee Break		
16:30-16:50	Cordial Volterra Integral Equations incorporating vanishing delays	Melusi Khumalo	University of Johannesburg, South Africa
16:50-17:10	Generalized logarithmic representation of infinitesimal generators for families of unbounded evolution operators	Yoritaka Iwata	Tokyo Institute of Technology, Japan
17:10-17:30	Euler-Maclaurin expansions of errors for multidimensional weakly singular integrals and their splitting extrapolation algorithm	Jin Huang	University of Electronic Science and Technology of China
17:30-17:50	A passive reaction force compensation (RFC) for a linear motor motion stage with negative stiffness mechanism*	Hyeong-Joon Ahn	Soongsil University, Republic of Korea

ISCAM 2017: Invited Session 3 & Technical Session 3

Session Chair:

Tokyo Room(东京厅), 3rd Floor, Conference Building

08:30-12:00, Tuesday Morning, February 28, 2017

ID	Paper Title	Author	Affiliation
VIP	Fuzzy Inner Product and Fuzzy Norm of Hyperspaces	Reza Ameri	University of Tehran Iran
VIP	On the Annihilator Graph of A Commutative Ring	Ayman Badawi	American University of Sharjah UAE
10:00-10:15	Coffee Break		
VIP	FIXED POINT THEORY FOR DIGITAL SPACES ASSOCIATED WITH KHALIMSKY AND MW-TOPOLOGY	Prof. Sang-Eon Han	Chonbuk National University, Republic of Korea

11:00-11:20	Two Probability Models Based on i-vertex Frequency Polygons for Traveling Salesman Problem	Yong Wang	North China Electric Power University, China
11:20-11:40	On Some Nonlinear Dynamic Inequalities of Gronwall-Bellman Type on Time Scales and Applications	Ahmed El-Deeb	Al-Azhar University, Cairo, Egypt
11:40-12:00	RESOLVENTS AND QUASI-NONEXPANSIVE MULTIVALUED MAPPINGS IN CAT(0) SPACES	G. Reza Zamani Eskndani	University of Tabriz, Iran
12:00-12:20	A note on weighted composition operators on Besov type spaces	Hamid Vaezi	University of Tabriz, Iran
12:20-12:40	ON GENERALIZED PATA-TYPE CONTRACTIONS MAPPINGS	Mohammad Khan	Sultan Qaboos University, Sultanate of Oman
12:40-13:00	FREE CONVECTIVE CURRENTS IN A POROUS CAVITY HEATED FROM BELOW: EFFECT OF HEAT SOURCES	Nirmal Sacheti	Sultan Qaboos University, Sultanate of Oman

Geology Series

Session Chair: Dr. Ya-juan Xue, Chengdu University of Information Technology & Chengdu University of Technology, China

Macao Room(澳门厅), 3rd Floor, Conference Building

14:00-18:00, Monday Afternoon, February 27, 2017

ID	Paper Title	Author	Affiliation
GRP2017_90001	Experimental Study on the Ultrasonic Testing Including Porosity of Rock Damage Characteristics	Jinhao Zhang	Institute of Geotechnical Engineering , Chongqing Jiaotong University
GRP2017_90003	Roadbed subsidence mechanisms under the driven of penetration-soak coupling	dan liang	Institute of Geotechnical Engineering, Chongqing Jiaotong University, Chongqing
GRP2017_90005	Study on sinking - sliding failure mechanism of perilous rock at Wangxia in Three Gorges of the Yangtze River, China	Chen Hongkai	Chongqing Jiaotong University

GRP2017_90006	Rainfall Threshold of Triggering Landslide-an Example of Typhoon Soudelor	YONGJUN LIN	Center for Weather Climate and Disaster Research, National Taiwan University
GRP2017_90009	Models, the establishment, and the real world: why do so many flood problems remain in the UK?	Colin Clark	CHRS, UK
GRP2017_90010	Saving lives: timely warnings for flash floods in the UK	Colin Clark	CHRS, UK
HEG2017_90004	Spatio-temporal variation of recharge rates from long-term groundwater monitoring data	Nam Woo	Yonsei University
MDP2017_90000	C-H-O stable isotope, elements and fluid geochemistry of Uraniferous Leucogranites in Gaudeamus Area, southern Central Zone, Damara Orogen, Namibia	Jinyong Chen	Beijing Research Institute of Uranium Geology
SGG2017_90002	Penetrative tectonic structures in shale complexes and their relation to mechanical properties: case study from the Baltic Basin (Poland/Sweden)	Marek Jarosinski	Polish Geological Institute
SGG2017_90024	The geomechanism model of the Central African Shear Zone and its related rift basins	Huang Tongfei	Research Institute of Petroleum Exploration&Development
SGG2017_90027	Structural characteristics and evolution of the Sufyan Depression, Muglad Basin in Sudan-south Sudan	Zhang Guangya	Research Institute of Petroleum Exploration&Development
SGG2017_90003	Diachronous growth of northern Tibet margin: an evidence for oblique stepwise rise model of Tibetan Plateau?	Fei Wang	IGGCAS
SPG2017_90005	Hydrocarbon Detection in Sulige Gas Field with Wavelet-based Cepstrum Decomposition Method	Ya-juan Xue	Chengdu University of Information Technology & Chengdu University of Technology
SPG2017_90004	Defining Reservoir Quality Relationships: How Important are Overburden and	Tuan Hoang	The University of Adelaide

Klinkenberg Corrections

SPG2017_90002	Reservoir Quality of Yabus Formation (Eocene), Great Palogue Field, Melut Basin, South Sudan	Mutwakil Nafi	" University of Bahir Dar
SPG2017_90000	The Study of Relationships between the Evaluated Parameters of	Hsien-Tsung Lee	Nan Kai University of Technology
SGG2017_90008 (Poster)	Determine stress field of the shirband area by Geometric and kinematic analysis of faults and folds	Hamid Roohafza	Shahrood University

Part IV Abstract

ISCAM 2017: Technical Session 1

Paper ID: ISCAM2017_90002

Title: The leader-following consensus for discrete-time linear multi-agent systems subject to directed switching graphs

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Abstract

The existing result on the leader-following consensus problem for discrete-time linear multi-agent systems subject to jointly connected switching graphs is limited to undirected graphs.

In this paper, we further study the same problem for the same class of linear multi-agent systems subject to directed jointly connected switching graphs.

It is shown that, under some mild assumption on the graph, the problem is solvable by a distributed state feedback control law. The effectiveness of our approach is illustrated by an example.

Paper ID: ISCAM2017_90010

Title: On Chorded Pancyclic Graphs

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Abstract

A graph G of order n at least 3 is said to be pancyclic if G contains a cycle of each length from 3 to n . In 1971, Bondy proved the following: If G is a graph of order n at least 3 with the minimum degree sum at least n , then G is pancyclic or $G=K(n/2, n/2)$. A chord is an edge between two vertices of a cycle that is not an edge on the cycle. A chorded cycle is a

cycle containing at least one chord. We define a graph G of order n at least 4 to be chorded pancyclic if G contains a chorded cycle of each length from 4 to n . In this talk, we will show the result on chorded pancyclic graphs analogous to Bondy's result. This is joint work with M. Cream and R.J. Gould.

Paper ID: ISCAM2017_90003

Title: Augmented Lagrangian Methods for Numerical Solutions to Higher Order Differential Equations

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Abstract

A large number of problems in engineering can be formulated as the optimization of certain functionals. In this paper, we present an algorithm that uses the augmented Lagrangian methods for finding numerical solutions to engineering problems. These engineering problems are described by differential equations with boundary values and are formulated as optimization of some functionals. The algorithm achieves its simplicity and versatility by choosing linear equality relations recursively for the **augmented Lagrangian** associated with an optimization problem. We demonstrate the formulation of an optimization functional for a 4th order nonlinear differential equation with boundary values.

We also derive the associated augmented Lagrangian for this 4th order differential equation.

Numerical test results are included that match up with well-established experimental outcomes. These numerical results indicate that the new algorithm is fully capable of producing accurate and stable solutions to differential equations.

ISCAM2017: Technical Session 2

Paper ID: ISCAM2017_90008

Title: Cordial Volterra Integral Equations incorporating vanishing delays

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Abstract

Cordial Volterra integral equations (CVIEs), associated with a noncompact cordial Volterra integral operator, have been prevalent in recent years since a number of real problems incorporate delayed history information. In this paper, we investigate some properties of cordial Volterra integral operators influenced by a vanishing delay. It is shown that to replicate all eigenfunctions λ , $\lambda=0$ or $\text{Re}(\lambda)>0$, the vanishing delay must be a proportional delay. For such a linear delay, the spectrum, eigenvalues and eigenfunctions of the operators and the existence, uniqueness and solution spaces of solutions are presented. For a nonlinear vanishing delay, we show a necessary and sufficient condition such that the operator is compact, which also yields the existence and uniqueness of solutions to CVIEs with the vanishing delay.

Paper ID: ISCAM2017_90022

Title: Generalized logarithmic representation of infinitesimal generators for families of unbounded evolution operators

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Abstract

According to the logarithm representation of operators, generators of invertible evolution families are characterized by the logarithm representation in Ref.[1]. In this article, the logarithm

representation is generalized to the infinitesimal generators for families of unbounded evolution operators. This treatment realized to go beyond the standard theory of abstract evolution equations (for example, see [2]).

References

[1] Y. Iwata, Infinitesimal generators of invertible evolution families, arXiv:1608.02047 (2016).

[2] H. Tanabe, Equations of evolution. Pitman, 1979.

Paper ID: ISCAM2017_90023

Title: Euler-Maclaurin expansions of errors for multidimensional weakly singular integrals and their splitting extrapolation algorithm

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Abstract

In this paper, multidimensional weakly singular integrals are solved by using rectangular quadrature rules which base on quadrature rules of one dimensional weakly singular and multidimensional regular integrals with their Euler-Maclaurin asymptotic expansions of the errors. The presented method is suit for solving multidimensional and singular integrals by comparing with Gauss quadrature rule. The error asymptotic expansions show that the convergence order of the initial quadrature rules is $O(h_i^{\alpha_i+1})$, where $-1 \leq \alpha_i \leq 0$. The order of accuracy can reach to $O(h_0^4)$ by using extrapolation and splitting extrapolation, where h_0 is the maximum mesh width. Some numerical examples are constructed to show the efficiency of the method.

Paper ID: ISCAM2017_90031

Title: A passive reaction force compensation (RFC) for a linear motor motion stage with negative stiffness mechanism*

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Abstract

A passive reaction force compensation (RFC) system for linear motor motion stage reduces residual vibration of system base by changing reaction force into vibration energy of a magnet track. Although a passive RFC can reduce vibration of the system base, spring or dummy mass should be replaced to tune its RFC performance. In this paper, we propose a passive RFC for a linear motor motion stage using negative stiffness mechanism. First, we introduce the passive RFC and negative stiffness mechanism. Then, the passive RFC using negative stiffness mechanism is proposed and its key features are summarized. Finally, the effectiveness of the passive RFC using negative stiffness mechanism is verified with simulation.

ISCAM2017: Technical Session 3

Paper ID: ISCAM2017_90049

Title: Two Probability Models Based on i -vertex Frequency Polygons for Traveling Salesman Problem

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Abstract

Two probability models based on i -vertex frequency polygons are given to prove a sparse graph for symmetric Traveling Salesman Problem. When we compute the frequency F of an edge e with N random i -vertex frequency polygons containing e , the first probability model illustrates the frequency F of the edges in the optimal Hamiltonian cycle approaches the maximum value $((i-2)(i+1))/2 N$ as n is big enough. The frequency of the $(n-2)$ edges conforms to a second normal distribution model $F \sim N((i-1)N, N\sigma^2)$ with which we can estimate the

number of edges with frequency F above a threshold, where the standard deviation σ is fixed for a specific number i . The two probability models mean the number of edges with frequency F close to $((i-2)(i+1))/2 N$ tends to cn as n is sufficiently large, where $c \ll n$. Thus, in theory we can compute a sparse graph with cn edges containing the optimal Hamiltonian cycle via frequency polygons for traveling salesman problem.

Paper ID: ISCAM2017_90009

Title: On Some Nonlinear Dynamic Inequalities of Gronwall-Bellman Type on Time Scales and Applications

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Abstract

In this paper we establish some new explicit bounds of solutions of a certain class of nonlinear dynamic inequalities of Gronwall-Bellman-Pachpatte type on a time scale. These inequalities formulate some integral and discrete inequalities discussed in the literature as special cases. Our results extend some known dynamic inequalities on time scales. The inequalities proved in this paper can be used as handy tools for the study of qualitative as well as quantitative properties of solutions of dynamic equations on time scales. Some examples are presented to demonstrate the applications of the results.

Paper ID: ISCAM2017_90028

Title: RESOLVENTS AND QUASI-NONEXPANSIVE MULTIVALUED MAPPINGS IN $CAT(0)$ SPACES

Name: G. Reza Zamani Eskandani

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Abstract

: In this paper , by iterative method, we find the common element of the minimizers of a finite family of convex functions and the common fixed points of a finite family of quasi-nonexpansive multivalued mappings in CAT(0) spaces.

Paper ID: ISCAM2017_90029

Title: A note on weighted composition operators on Besov type spaces

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Abstract

A note on weighted composition operators on Besov type spaces

Paper ID: ISCAM2017_90030

Title: ON GENERALIZED PATA-TYPE CONTRACTIONS MAPPINGS

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Abstract

In this paper , existence of fixed point for Pata type Zamfirescu mapping in complete metric space has been proved. Our results gives existence of fixed point for wider class of functions than those considered in [1–5, 7, 8]. We also prove the best proximity point result which generalizes the result of [5].

Paper ID: ISCAM2017_90033

Title: FREE CONVECTIVE CURRENTS IN A POROUS CAVITY HEATED FROM BELOW: EFFECT OF HEAT SOURCES

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Abstract

The study of two-dimensional laminar convective flows of viscous incompressible fluids inside finite porous enclosures has received considerable attention in the literature due to a range of engineering and industrial applications. In such flows, it is important to know thermal conditions that prevail on the boundaries of the enclosure, the nature of the permeable material which fills the inner space of the enclosure and the geometrical shape of the enclosure. Although such features are known to vary from one application to another, they, however, have significant bearing on the ensuing convective currents. In the present work, we have considered a non-rectangular enclosure in the shape of a trapezoidal cavity, with vertical side walls and a sloping upper surface, filled with an isotropic porous material of low to moderate permeability. The side walls of the enclosure are assumed to be adiabatic while the lower horizontal boundary is assumed to be heated from below. It is further assumed that the flow domain is subject to internal heat generation/absorption mechanism brought about by the presence of heat sources or sinks. The partial differential equations together with a set of momentum and thermal conditions that govern the free convective flow have been solved numerically assuming the Boussinesq approximation to hold and the Darcy law to model the flow within the porous material. The non-dimensionalization process to which the associated boundary value problem has been subjected to, lead to a number of key parameters such as Rayleigh number, aspect ratio, internal heating parameter. The influence of these parameters as well as the sloping parameter on isotherms and streamlines has been illustrated for a range of values.

Gology Series

Paper ID: GRP2017_90001

Title: Experimental Study on the Ultrasonic Testing Including Porosity of Rock Damage Characteristics

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Abstract

Cement mortar specimens are used to simulate the fracture of rock material under uniaxial compression test, using the ultrasonic instrument measurement test process, the waveform and wave velocity results along with the change of specimen fracture extension are obtained. Experimental results show that at 0MPa, there are micro - defects in the specimen, leading to the irregular change of the waveform of the measuring points 4# and 5#; At 1 ~ 4MPa, there is no crack on the surface of the specimen, the waveform of ultrasonic wave is stable, and the velocity of each point increases with the increase of the strain, but the measuring point increases the wave velocity when the load is applied; When the specimen surface cracks, expect the waveform of measuring point 4# and 5# change in irregularities, the measuring point 2# waveform also changes irregularly and measuring point of the wave velocity has decreased; At the crack propagation stage, ultrasonic wave also changes irregularly along with the expansion of crack, wave velocity with the increase of the strain is also obvious downward trend; When the crack penetrates the whole specimen, the waveform of each measuring point changes abnormally, the continuity is bad, the waveform is irregular and the measured wave velocity is low.

Paper ID: GRP2017_90003

Title: Roadbed subsidence mechanisms under the driven of penetration-soak coupling

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Abstract

Roadbed subsidence is one of the main types of highway flood damage, River's cyclical fluctuations and roadbed soil suffers the water soak softening long time induced highway roadbed subsidence along the river. Base on unsaturated soil mass suction penetration theory and simplify the roadbed model, applying Swedish circle method to establish roadbed stability coefficient. Example analysis shows that, soil roadbed suffers the water permeability-soak , roadbed's stability reduce with the time, and leads to roadbed subsidence. Research results for improving roadbed subsidence water logging mechanism understanding level has a positive meaning.

Paper ID: GRP2017_90005

Title: Study on sinking - sliding failure mechanism of perilous rock at Wangxia in Three Gorges of the Yangtze River, China

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Abstract

The giant perilous rock at Wangxia (named Wangxia perilous rock) is representative in Three Gorges of the Yangtze River, China, has threatened badly the navigation of the Yangtze River channel for a long period. The giant perilous rock is composed of siliceous limestone and argillaceous limestone, and includes two elements marking by W1 and W2, respectively. The W1 is an isolated pillar while the W2 is in clintheriform. The linking segment of dominant fissure in the W2 is composed by moniliform solution funnels at its back, and the locked segment of the dominant fissure at the base of the W2 is composed by two parts. For the locked part of the dominant fissure of the W2, the upper segment shows the same lithology with the perilous rock and it can be simplified as an elastic medium, for the lower segment composed by argillaceous shale and mudstone can be simplified as a strain-softening medium. Introducing the water-softened function, the

constitutive curves with two kinds of medium materials for the locked segment in the dominant fissure of the W2 have been proposed. Based on energy principle, the cusp catastrophe model for perilous rock rupture is built and formulas for the transient elastic and impulsive acceleration and the elastic-impulsive velocity of perilous rock catastrophe rupture have been established. By the calculation, the elastic-impulsive acceleration for the catastrophe rupture of the W2 is 531.4 m/s², while the average elastic-impulsive velocity is 2.608 m/s. Further, it is deduced that the elastic-impulsive velocity at the base of the W2 is about 5.2 m/s. For the transient rupture of the W2, there is a greater speed difference between the top and the base of the W2, which impels the giant perilous rock to be retroverted sliding rupture, coinciding with the fact. Undoubtedly, studies in this paper must play an important role to analyze the catastrophe rupture mechanism of giant perilous rocks at both banks in Three Gorges of the Yangtze River, China.

Paper ID: GRP2017_90006

Title: Rainfall Threshold of Triggering Landslide-an Example of Typhoon Soudelor

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Abstract

Typhoon Soudelor induced many landslides in Xindian District and Wulai District, New Taipei City, Taiwan in 2015. It claimed road blockage, communication loss, and stranded hundreds of residents. In this study, we collected data from neighboring rain gauge stations including Fushan Station, Datongshan Station, and Cyuchih Station for investigation of rainfall threshold of triggering a landslide. It is found that 24-hr accumulative rainfall (R24) and 3-hr average rainfall (I3) before land sliding are suitable for setting the thresholds for triggering a landslide (Cheng, 2014). For typhoon

Soudelor, R24= 700 (mm) and I3=70 (mm/hr) are suitable for the thresholds for triggering landslide preliminarily. More data are needed to verify this result.

Paper ID: GRP2017_90009

Title: Models, the establishment, and the real world: why do so many flood problems remain in the UK?

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Abstract

In spite of the proliferation of research and Government Reports on floods in the UK, there are about 5 million people who live in flood prone areas. Many of the houses have been built during the past 50 years with little regard to the existing and future flood risk. Decision makers, who are part of the Establishment, rely on the outputs of models which are produced by so called “experts”. But this knowledge has found to be flawed, both in relation to matters of fact and also analysis. However, the Establishment is largely unwilling to admit local knowledge in flood risk assessment, even though prevailing methodology suggests otherwise. This situation has grown worse since the formation of the Environment Agency in 1996. The public engagement with flood risk science and its application needs to proceed along a co-production model (Callon, 1999). Three examples of the difficulties of making realistic assessment of fluvial flood risk are described. The problem of surface water flooding is also considered since it too has local causes which may not be accounted for in standard methodology. Finally, more open discussion and co-operation in identifying flood problems in the UK is called for.

Paper ID: GRP2017_90010

Title: Saving lives: timely warnings for flash floods in the UK

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Abstract

Flash floods are a major cause of death and destruction to property on a worldwide scale. In the UK sudden flooding has been the cause of the loss of over 50 lives during the last century. Forecasting these events to give enough warning is a major concern: after the 2004 flood at Boscastle, Cornwall UK the Environment Agency (2004) stated that it was not possible to provide a warning in such a fast reacting and small catchment. This is untrue since the Agency had already implemented a real time non-linear flow model as part of a flood warning system on the upper Brue in Somerset UK. This model is described in this paper as it has been applied to the Lynmouth flood of 1952, and briefly for the Boscastle catchment, both of which have an area of about 20 km². The model uses locally measured SMD and saturated hydraulic conductivity data. With the addition of further parameters the model has been successfully used nationwide.

Paper ID: HEG2017_90004
Title: Spatio-temporal variation of recharge rates from long-term groundwater monitoring data
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Abstract

Even in the same catchment area, the depth and the matrix of unsaturated zones are spatially heterogenous, and thus, recharge rates from precipitation events should be spatially various. In this study, groundwater recharge rates were estimated from the 10-yr groundwater monitoring data from 2005 to 2014 in Korea. Five monitoring stations were selected in the drought-experienced areas since 2010. Due to lagging and superposition effects of precipitation events to groundwater responses,

cumulative water-level changes were correlated to continuous precipitation events. The slope of the correlation means the recharge rate over specific yield, indicating that the value is site specific of the monitoring stations. Eight years of data were used to draw the quantitative model between the cumulative water-level changes and the continuous precipitation events, and the last two years of data were used to verify the relationship. In addition, groundwater monitoring data were subdivided into seasonal groups as spring from March to May, summer from June to August, fall from September to November, and winter from December to February. At Euiryong catchment, summer recharge is higher than fall, however, at Boeun catchment groundwater recharge rate is greater in fall than in summer. Thus the site-specific recharge rates show seasonal and spatial variations. With the impact of global climate change, the importance of water-resource management becomes higher than ever, and the results of this study could contribute more detailed analysis and effective management of the localized water resources.

Paper ID: MDP2017_90000
Title: C-H-O stable isotope, elements and fluid geochemistry of Uraniferous Leucogranites in Gaudeanmus Area, southern Central Zone, Damara Orogen, Namibia
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Abstract

This paper focuses on the effect of the later hydrotherm on uraniferous leucogranites and the stages of uranium mineralization. Here, we review C-H-O stable isotope, elements and fluid geochemistry of uraniferous leucogranites in Gaudeanmus, Namibia. The results show that there is significant increasing amount of rare earth element from non - mineralized to uraniferous leucogranites,

indicating the synchronization of REE enrichment and uranium mineralization. Uranium enrichment may have close relations with Pb, Th, Co, Ni, REE in this region, so REE and U evidently exist homology. There are at least two stages of uranium mineralization by later hydrothermal alteration: firstly, due to magmatic residual high temperature and low salinity fluid, the temperature of main metallogenetic epoch ranges from 470°C to 530°C, salinity ranges from 3.55% to 9.60% NaCleq, and C, H, O stable isotope is -23‰~-13.6‰, -53.3‰~-46.4‰, 7.71‰~8.81‰, respectively. Secondly, due to superimposed hydrothermal fluid, the temperature, salinity, and C, H, O stable isotope is 150°C~220°C, 4.65%~19.05% NaCleq, -20.3‰~-3.7‰, -64.7‰~-53.6‰, 1.49‰~1.99‰, respectively. The fluid for reformation is derived from postmagmatic fluid, mixed with a number of meteoric water.

Paper ID: SGG2017_90002

Title: Penetrative tectonic structures in shale complexes and their relation to mechanical properties: case study from the Baltic Basin (Poland/Sweden)

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Abstract

Penetrative tectonic structures in shale complexes and their relation to mechanical properties: case study from the Baltic Basin (Poland/Sweden)

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One of the main goal of gas-bearing shales characterization is natural fracture and fault pattern that both control the efficiency of reservoir stimulation treatment. We have performed structural and geomechanical survey in several deep boreholes in the Pomeranian region (Poland) and supplement it with outcrop observations from Scania (Sweden). The target of our study is the Lower Paleozoic shale complex of the Baltic Basin that extends on both

sides of the present-day Baltic Sea. In the time of shale complex deposition, in Ordovician and Silurian, the basin was located at the continental margin of the Baltica involved in convergence with the Avalonia microcontinent. A long distance from the collision zone to the study area allowed the shale reservoir to avoid significant tectonic deformation. Such penetrative tectonic structures in slightly deformed rocks draw growing attention of oil industry due to development of more sophisticated methods of hydrocarbon production from tight or fractured reservoirs. The goal of presentation is to show how a great deal of industrial data can be used in detail structural reservoir characterization and evaluation of geophysical logging data performance for tectonic profiling. Specific features of structural pattern in laminated and anisotropic shale complexes is also addressed.

From the subsidence history analyses and the 3D seismic interpretation, we have deduced that during foundation of penetrative fracture network (joint system) the shale complexes were buried at a depth similar to their present-day position and therefore acquired advanced compaction and lithification level that determine mechanical properties comparable to recent. That notion, opens space for further considerations on tectonic fracture network dependence on mechanical rock properties measured in laboratory and inferred from borehole geophysical survey. Using full set of high quality borehole geophysical logging including electrical resistivity scanner and having access to several hundred meters long continuous borehole core from the same depth intervals we were able to collect vast set of independent structural observations and assess reliability of geophysical data interpretation for structural shale characterization. The detail joint fracture network was reconstructed using nonstandard procedure of weighting fractures by their height and veins by their aperture. We have found similar joint fabric within each separated shale formation that persists over several tens of kilometers from one borehole to the other. More significant differences between boreholes are explained in terms

of interference with the local fault zones. Our study of joint fracture network indicates good correlation of fracture size, density and direction with mechanical stratification of analyzed profiles. However, fracture density does not seem to be a direct function of brittleness, but other factors like bedding thickness and organic carbon content have to be taken into account. Finally, we have compared the reconstructed fracture system of the Polish side of Baltic Basin (south) with the Swedish side (north) and inferred the regional range of the main joint fracture sets, however again, overprinted by local or regional fault systems.

Paper ID: SGG2017_90024

Title: Huang Tongfei

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Email: The geomechanism model of the Central African Shear Zone and its related rift basins

Abstract

The formation mechanism of the Central African Shear Zone (CASZ) and its related rift basins (mainly the Muglad Basin, Salamat Basin, Doseo Basin, Doba Basin and Bongor basin) has not yet been perfectly defined. By analyzing the structure of the African plate basement, the structural events of the African plate and the peripheral plates during the Late Jurassic to the Early Cretaceous and contrasting to the formation mechanism of the transitional fault of the African Mid-Atlantic Ridge, this paper presents a new interpretation of the formation mechanism of the CASZ, which is that the formation mechanism is the same as the transition fault of mid-ocean ridge, and the formation time is from Late Jurassic to Early Cretaceous, and the tectonic position is the active belt between Sahara Craton and Congo Craton. The background of the formation is during Pan-African tectonic movement, the African Plate was composed of many stable craton nuclei and active belts, and the basement structure was heterogeneous. Since the

Mesozoic, the disintegration of the western Gondwana Continent and the opening of the Atlantic Ocean from the south to the north had been undergoing. This difference in stress between the north and the south resulted in the rupture of the structural weak zone between the stable cratons and the strike-slip faulting, resulting in the formation of the CASZ between the Congo Craton and the Sahara Craton. When the shear zone extends in the north-east direction out of the Congo Craton, no longer subject to the constraints of the Congo craton, the property of the basement changed again, which led to, at the end of the shear zone, the strike-slip stress field converting to stretch stress fields, forming the Muglad basin, the Bongor basin, and the Salamat, Doseo and Doba basins within the fault zone. This model of formation mechanism is very useful to explain the special formation time and position of the CASZ, and also provides evidence for the formation mechanism of the intracontinental rift basin, so it is of great significance.

Paper ID: SGG2017_90027

Title: Zhang Guangya

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Email: Structural characteristics and evolution of the Sufyan Depression, Muglad Basin in Sudan-south Sudan

Abstract

By identifying the structural patterns on seismic profile and restoring the tectonic evolution history of the major profile, the structural characteristics and evolution of Sufyan Depression, Muglad basin, has been studied. The results show that, the Sufyan Depression is a graben that is steep in the south and gentle in the north as a whole, and the tectonic framework presents "west-east differentiation and north-south dissimilitude". Normal faults can be classified into two major categories and five types, of which the basement-involved listric normal fault

and sedimentary cover-rotary plain normal fault are the main type. As the tectonic evolution of Central Africa Shear Zone and the periphery plates progressed, the Sufyan Depression experienced three stages of fault-depression evolution: the first stage in the Early Cretaceous Barremian to Late Cretaceous Turonian is very intense, the second in the end of Late Cretaceous to Paleocene and the third in the Neogene until Present are quite weak. In addition, during the depositional stage of the fourth and fifth member of the Abu Gabra Formation, which is also the early period of the first evolution stage, the depocenter is located in the central and southern Sufyan Depression; during the last two stages, however, the depocenter is located in the subsag which is adjacent to the southern boundary fault. Thus, it is predicted that the central sag will be favorable exploration area of the fourth member of the Abu Gabra Formation (the deep strata).

Paper ID: SGG2017_90003

Title: Diachronous growth of northern Tibet margin: an evidence for oblique stepwise rise model of Tibetan Plateau?

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Abstract

Models of how high elevations formed across Tibet predict: (a) continuous thickening as a "viscous sheet"; (b) time-dependent, localized shear along fault zones between rigid blocks; and (c) synchronous deformation across Tibet with collision. Our new observations may shed light on this issue. Here, we use $^{40}\text{Ar}/^{39}\text{Ar}$ and (U-Th)/He thermochronology to elucidate the exhumation history from massifs in hanging wall of thrust structures along the Kunlun Belt - the first-order orogenic range at the northern Tibetan margin. Results show that these massifs, and hence the plateau margin, were subject to slow, steady exhumation during Early Cenozoic, followed by a

pulse of accelerated exhumation, beginning at ~40 Ma in the west part and at ~35 Ma in the east part. The exhumation rate turns strong westwards (from ~0.22 to 0.5 mm/yr), and two-fold extent of uplift is resolved in the west part that is as strong as in the east part. We related these observations to the oblique step-wise rise model. After the collision, strain propagated to the northern margin of Tibet, and oblique subduction beneath Kunlun caused stronger compressional deformation in the west part than in the east part, resulting in diachronous growth and lateral extrusion.

Paper ID: SPG2017_90005

Title: Hydrocarbon Detection in Sulige Gas Field with Wavelet-based Cepstrum Decomposition Method

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Abstract

Gas reservoir in Sulige gas field, Ordos Basin, is mainly tight sandstone reservoir. Hydrocarbon detection is difficult due to the strong heterogeneity of the sandstone reservoir, thin reservoir thickness, quickly changed horizontal distribution of the reservoir and the scatter vertical distribution of the reservoir. The strong reflection amplitudes in the seismic response of the source rocks near the reservoir in the 8th sections of the Xiashihezi formation further makes the seismic response of the gas-bearing reservoir much weaker. Wavelet-based cepstrum decomposition method is used as one effectively weak signal detection method for hydrocarbon detection in Sulige gas field. This method mainly uses the first- and second-order cepstrum coefficients of the cepstrum to produce and has the capability to detect hydrocarbon. Model test and the seismic data applications show that wavelet-based cepstrum decomposition method is more effective than the wavelet transform based

spectral decomposition method. The strong reflection amplitudes in the seismic response of the source rocks near the reservoir in the 8th sections of the Xiashihezi formation do not affect the hydrocarbon detection with wavelet-based cepstrum decomposition method. Wavelet-based cepstrum decomposition method makes the instantaneous amplitude of the cepstrum meaningful and reduces the burden of needing many dozens of seismic volumes to represent the response to a different mono-frequency section in the interpretation of spectrum decomposition. The method can be used as a new analysis tool for the reservoir characterization. This work was supported in part by the National Natural Science Foundation of China under Grant 41430323, Grant 41404102 and Grant 41274128, in part by the Sichuan Youth Science and Technology Foundation under Grant 2016JQ0012, in part by the Key Project of Sichuan provincial Education Department (16ZA0218), in part by the 2015 Annual Young Academic Leaders Scientific Research Foundation of CUIT (J201507), and in part by the Project of the Scientific Research Foundation of CUIT (KYTZ201503)

Paper ID: SPG2017_90004

Title: Defining Reservoir Quality Relationships: How Important are Overburden and Klinkenberg Corrections

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Abstract

Reservoir quality from cored intervals has traditionally been described by grouping similar intervals according to rock type. The main shortcoming of this static modelling approach is that it lacks clarity and it is not conducive for setting up a dynamic simulation model. The alternative is to use a modelling approach based on Hydraulic Flow Zone Units (HFZUs), first proposed in 1989 using the Carman-Kozeny (C-K) formulation. More recently,

this initial approach has been extended to cover a wider range of geological formations with diverse pore structure types. In using a HFZU approach, a pre-processing step is customarily undertaken to first overburden correct the data and where necessary also to correct for the Klinkenberg effect (lower permeability formations, lab tested with a gas). The study presented compares corrected and uncorrected data sets, to see if correction alters the overall outcome of HFZU analysis. Using a Global Characteristics Envelope (GCE), several data sets are tracked, ambient data, overburden (only) corrected data and finally data that has been corrected for both effects. In all cases it is the Flow Zone Indicator (FZI), an index representative of formation quality that is tracked, together with the type of relationship. Several comparative analysis examples are given for diverse formations. The results shows that uncorrected data can yields a different correlation and FZI, especially for intervals that include low permeability samples. This outcome implies that Overburden and Klinkenberg correction must be performed before the HFZU analysis.

Paper ID: SPG2017_90002

Title: Reservoir Quality of Yabus Formation (Eocene), Great Palogue Field, Melut Basin, South Sudan

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Abstract

Melut Basin extends southeastwards from southern Sudan into South Sudan Republic and Ethiopia. In Melut Basin the depositional sequence is dominated by fluvial and lacustrine sandstones and mudstones. More than 900 million barrels of oil have been discovered in Great Palogue Field which is located in the northern part of Melut Basin. The lacustrine shales of the Galhak and Al Renk Formations are the main potential source rocks in Melut Basin. Samaa

and Yabus Formations are represented the main reservoir targeted for hydrocarbon accumulation in Melut Basin. Grain size analysis, heavy minerals analysis, petrographic, Scanning Electron Microscope (SEM) and X-ray Diffraction (XRD) techniques are used to study the reservoir quality of Yabus Formation. The analysis of data reveals that the reservoir of the Yabus Formation is mainly consisting of feldspathic sandstone (Arkosic) with minor amount of quartz arenite and lithic arenite sandstone. The sandstone is very fine to very coarse grained, sub angular to well round and moderately to well sort. The reservoir porosity ranges from moderately to very good porosity. The heavy minerals in sandstone indicate that, the strong presence of less stable heavy minerals staurolite and kyanite, reflecting of metamorphic origin. The clay minerals are composed of kaolinite, smectite, illite, mixed layer smectite/illite and chlorite. The major mineralogical change with depth takes place over the interval involves, smectite conversion into illite or I/S mixed, the decomposing of mica and decomposing of feldspar. The authigenic clay minerals are consist of kaolinite, chlorite and smectite/illite mixed layer. The diagenetic sequences of Yabus Formation include growth of authigenic I/S mixed layer and authigenic chlorite rims around quartz grains, dissolution of feldspar to form authigenic kaolinite, authigenic kaolinite porefilling, dissolution of feldspar to form secondary porosity, authigenic feldspar overgrowth, formation of pressure solution of quartz and formation of quartz over growth. The reservoir quality is generally good with good porosity and permeability in primary reservoirs, and medium-low porosity and permeability in secondary reservoirs. The reservoir quality of Yabus Formations seems to be controlled by heterogeneities such as facies architecture, geometry and depositional styles. It is also affected by sandstone detrital composition, texture grain size and diagenetic features.

Paper ID: SPG2017_90000

Title: The Study of Relationships between the Evaluated Parameters of

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Abstract

The results from statistical analysis of the all parameters data for all samples in this research work, not only be executed a linear regression, curve regression between any two parameters, and multivariate regression, but also be carried on the forecast of grey correlation grade of grey theory (include grey relational generating (Nominal-the-better-: Ro%; Larger-the-better-: Tmax, HI, QI, BI, S2, S1+ S2, S1; smaller-the-better-: TOC, PI) and globalization grey relational grade). The range of the oil expulsion window defined by Ro%, Tmax, cross-plots, Grey Model and statistical analysis are all in good agreement. So far, achieve approximately consistent results from two modes predictive analysis. Petroleum potential can be divided into

four different parts based on the cross-plot of HI vs. %Ro. The highest petroleum potential is located in the second part with %Ro=0.6-1.0%, Tmax=430-450 °C, HI>100, and QI>120. Oil generation potential is rapidly exhausted in the third part with %Ro >1.0%. This result is in accordance with the regression curve of HI and QI with %Ro based on 97 samples with %Ro=1.0~5.6%. The exponential equation of regression can thus be achieved: $HI = 994.8e^{-1.7Ro}$ and $QI = 1646.2e^{-2.0Ro}$ ($R^2=0.72$). The worldwide datasets of 1140, 608, and 506 samples of organic matter from Carboniferous to Cenozoic was used to analyse the evolution of the Hydrogen Index (HI), Quality Index (QI), and Bitumen Index (BI) correspond to increasing thermal maturity. Based on Grey Model and statistical analysis, and cross-plots of HI, QI and BI versus the vitrinite reflectance (%Ro) and Tmax (oC), the HImax, QImax and BImax lines are defined between the vertex of the upper and lower limits of the HI-band, QI-band and BI-band as defined by a

majority of the samples. The constructed HI, QI Page 2 of 2 and BI bands were broad at low maturities and gradually narrowed with increasing thermal maturity. The petroleum generation potential is completely exhausted at a vitrinite reflectance of 2.0-2.2% or a Tmax of 510-520 °C. A decline in BI signifies the start of the oil expulsion window and occurs within the vitrinite reflectance range 0.75-1.05% or a Tmax of 440-455 °C.

Paper ID: SGG2017_90008 (poster)

Title: Determine stress field of the shirband area by Geometric and kinematic analysis of faults and folds

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Abstract

In this paper faults and folds of shirband area investigated to determine the orient of the stress field. The study area is limited between the two faults with E-W strike and northward slip. Investigations result show major faults of the area have sinistral mechanism. Waterways displacement and slicken slip of faults approve this issue. Three main folds of area has approximately same trend along major faults (E-W). Orientation of stress field investigated and classified by using from some large and medium scale faults and folds. Analysis of stress field investigated by inversion method show that compression axis in the study area have approximately NE-SW strike.

Part V Instructions for Presentations

Oral Presentation

Devices Provided by the Conference Organizing Committee:

- Laptops (with MS-office & Adobe Reader)
- Projectors & Screen
- Laser Sticks

Materials Provided by the Presenters:

- PowerPoint or PDF files

Duration of each Presentation:

- Regular Oral Session: 15-20 Minutes of Presentation
- Invited Speech: 40 Minutes of Presentation

Part VI Hotel Information

About Hotel

International Asia-Pacific Convention Center Sanya is a five star standard luxury hotel, which locates beside the seashore, and is the ideal place for vacation and conference. The hotel has 254 luxury and comfortable rooms, and 16 conference rooms in different sizes. The conference rooms can accommodate people from 20-1000 and totally square 5400m2. Housing, dining, recreation facilities... everything needed is ready, Even National initiative seawater swimming pool, sea recreational centre and so on, which make you a pleasant vacation. High-speed net connectors are equipped in the houses and service of renting laptops is provided, all these give you a convenient office atmosphere while you are on vacation.

Address: No.17, Haipo tourism and economic zone, Sanya Bay, Sanya city, China

三亚市三亚湾海坡旅游经济开发区17横路

URL: www.iapccsanya.com

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How to Get to the Hotel

Downtown of Sanya: 30 minutes ride

Sanya Phoenix Airport: 15 minutes ride

Sanya International Golf Club: 20 minutes ride

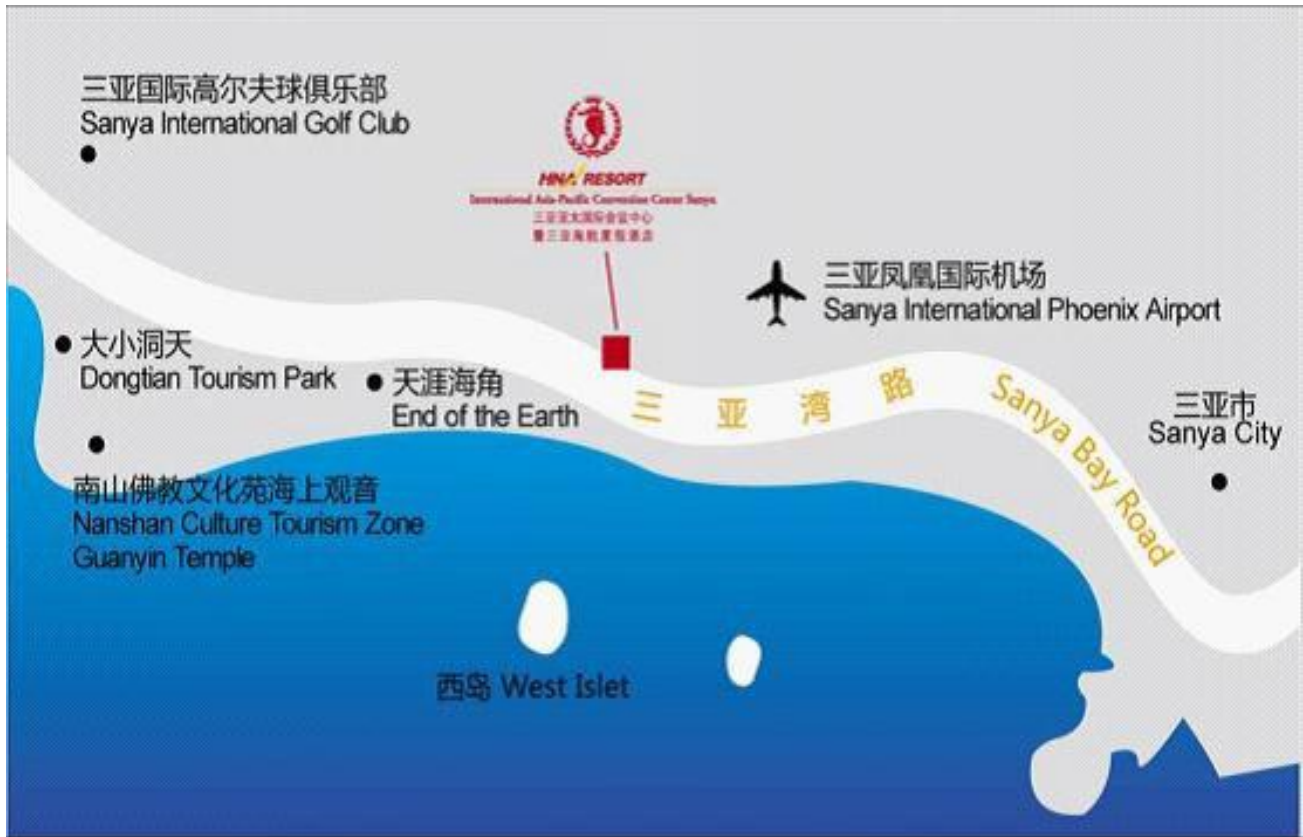
End of the Earth: 10 minutes ride

For non-Chinese author, please show the following info to the driver if you take a

taxi:

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亚太国际会议中心暨三亚海航度假酒店



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