

“环境力学文摘”，第1期，2014年12月1日

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依托单位：[中国力学学会环境力学专业委员会](#)。

每两个月发送，免费订阅、自由退订。欢迎发布信息、交流体会、共享经验。

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新闻报道

2014年全国环境力学学术研讨会暨专业委员会年会在天津成功召开

(袁德奎教授供稿)

2014年全国环境力学学术研讨会暨环境力学专业委员会年会于2014年8月15-17日，在天津政协俱乐部召开。本次会议由中国力学学会环境力学专业委员会主办，天津大学承办。来自全国31个研究院所及高校的110余位环境力学领域的专家学者和青年学生参加了本次研讨会。

会议开幕式由天津大学力学系陶建华教授主持，天津大学副校长冯亚青教授、中国科学院院士李家春研究员、中国工程院院士徐祥德研究员、环境力学专业委员会主任刘青泉研究员分别致开幕辞。环境力学专业委员会副主任，上海大学王道增教授、清华大学崔桂香教授、武汉大学曹志先教授、兰州大学黄宁教授，天津市力学学会理事长李鸿琦教授，以及20余位环境力学专业委员会委员和特邀委员出席了开幕式。

会议围绕环境力学学科前沿,以及实际工程中的环境力学问题开展了深入的学术交流，共宣读了60篇学术论文。会议特别邀请到在大气环境、水环境、海洋环境、重大灾害、地质体环境等领域的12名专家为参会代表作了精彩的大会邀请报告。其中既有李家春院士、徐祥德院士、陶建华教授等在环境力学领域长期耕耘的资深专家；也有曹志先教授、槐文信教授和蔡树群研究员等卓有建树的中年骨干；还有来自中国气象局北京城市气象研究所的苗世光研究员、中科院成都山地灾害与环境研究所的胡凯衡研究员、清华大学的王兵副教授、浙江大学的贺治国副教授、兰州大学的薄天利副教授等近年来在环境力学领域崭露头角的青年学者。与会代表普遍反映，两天的会期日程紧凑，紧张而有序，接收到的信息量很大，对环境力学研究的前沿领域及最新成果有了比较全面的了解，拓宽了学术视野，也加深了与同行的联系，达到了很好的学术交流目的。

会议期间，力学学会环境力学专业委员会召开了工作年会。专业委员会主任委员刘青泉研究员汇报了专委会2013-2014年的工作情况，征求各位委员对专委会工作的意见和建议，并集中讨论了专业委员会今后的工作目标。各位委员在以下四方面达成了共识：1) 在全国环境力学工作者的大力支持下，“全国环境力学学术研讨会”自2005年开始,连续举办了十年，实质上已经成为了系列学术会议，决定从2015年开始将本研讨会真正办为环境力学专业委员会的系列学术会议,并更名为“全国环境力学学术会议”；2) 为更好地发挥专业委员会的作用，灵活高效地组织各方面力量开展环境力学领域的研究工作，建议组建专业组，并拟设置水环境、大气环境和环境灾害三个方面的专业组；3) 决定于2015年在上海举行的全国力学大会期间,举办“第十一届全国环境力学学术会议”，并动员各位委员积极参与会议的组织 and 宣传工作；4) 积极加强环境力学专业网站的建设及宣传工作。此外，各位委员还就当前环境力学研究的前沿问题、委员会换届、人才培养、队伍建设、科研项目组织等方面进行了讨论。

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[历届全国环境力学学术研讨会简介](#)

(刘青泉教授供稿)

为了促进力学学科在认识和解决环境问题中发挥更好的作用,推动我国环境力学的学科发展和科研创新,凝聚和培养该领域的科研队伍,国家自然科学基金委员会数理科学部于2005年组织召开了第一届全国环境力学研讨会，并连续4年组织了四次全国环境力学研讨会。2008年11月，中国力学学会成立“环境力学专业委员会”，自此，该研讨会发展成为环境力学专业委员会负责主办的旨在促进我国环境力学发展的系列研讨会。

2005年5月27-29日：国家自然科学基金委员会数理科学部在北京组织召开了第一届全国环境力学研讨会（中国科学院力学研究所承办）。集中讨论了环境力学的学科内涵、社会需求以及关键科学问题,简要部署了近期环境力学的重要研究领域和方向。

2006年9月25-26日：国家自然科学基金委员会数理科学部，在兰州召开了第二届环境力学研讨会（兰州大学西部灾害与环境力学教育部重点实验室承办）。就环境力学的学科基础、二级分支学科的确立、学科布点、研究队伍以及近期重要方向等进行研讨这两次会议为我国环境力学的研究发展起到了积极的指导作用。

2007年10月16-17日：国家自然科学基金委员会数理科学部，在武汉召开了第三届全国环境力学研讨会（武汉大学水资源与水电工程科学国家重点实验室承办）。本次会议分为学术交流和主题研讨两部分进行。学术交流主要围绕“环境力学与重大工程及灾害”这一主题，采用学术报告形式交流近年来我国学者在环境力学领域的最新研究进展和成果；主题研讨则重点围绕“我国环境力学的近期重要领域、各主要研究基地或学科点的主

攻方向,以及促进我国环境力学发展的措施等”进行研讨和布局。

2008年10月12-14日: 国家自然科学基金委员会数理科学部,在上海召开了第四届环境力学研讨会(上海大学应用数学和力学研究所承办)。针对近年来频发的极端环境事件这一主题,采用学术报告的形式进行广泛的交流,并着重研讨了“环境灾害中的复杂介质特性”、“自然界复杂流动建模”、“极端环境灾害事件发生、发展和演化”、“次生灾害及其影响”等问题。

2008年11月: 环境力学专业委员会成立。

2009年8月24-26日: 在郑州召开的2009全国力学大会期间,召开了环境力学专业委员会成立大会,并组织召开了环境力学分会场暨全国环境力学学术研讨会,以及“风沙运动与大气环境”、“环境水动力学”专题研讨会。

2010年9月15-17日: 中国力学学会环境力学专业委员会和流体力学专业委员会,在兰州联合主办了以“力学与环境”为主题的学术研讨会(兰州大学西部灾害与环境力学教育部重点实验室承办)。

2011年8月22-24日: 在哈尔滨召开的2011全国力学大会期间,环境力学专业委员会组织了以“力学与环境灾害”为主题的环境力学分会场暨全国环境力学学术研讨会,以及“环境水动力学”专题研讨会。

2012年9月15-18日: 环境力学专业委员会在乌鲁木齐主办了2012年全国环境力学学术研讨会(新疆大学承办)。

2013年8月19-21日: 在西安召开的2013全国力学大会期间,环境力学专业委员会组织了环境力学分会场暨全国环境力学学术研讨会,以及“大气边界层中的风沙与大气环境、水环境”专题研讨会。

2014年8月16-17日: 环境力学专业委员会在天津主办了2014年全国环境力学学术研讨会(天津大学承办)。

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2014年国家自然科学基金重点项目“泥石流孕育发生和发展的动力学模型与机理研究”获得资助

(曹志先教授供稿)

由中国科学院力学研究所刘青泉研究员负责,与武汉大学曹志先教授合作,共同申请的2014年国家自然科学基金重点项目“泥石流孕育发生和发展的动力学模型与机理研究”获得国家自然科学基金的资助,项目总经费420万元,执行期限为2015年01月至-2019年12月。

该项目将针对泥石流的形成机制和运动规律这一关键问题,以土石水混合介质力学特性为切入点,采用力学理论和方法,发展水沙混合介质强度和流变等力学特性的理论,探讨水-颗粒以及流动-底床之间的耦合作用机制,建立水渗流与土石混合体耦合作用模型和泥石流运动耦合模型;揭示泥石流孕育、发生的多因素综合作用和多过程耦合机理,提出泥石流发生的临界动力条件和诊断方法,实现对泥石流运动与底床冲淤变化的强耦合数值模拟,增强对泥石流发生、演变和发展规律的理解。从而,为提高对泥石流灾害的定量预测能力提供科学理论和方法,并进一步深化对复杂介质和多过程耦合问题的认识,丰富和发展环境力学这门新兴交叉学科的内容、方法和理论。

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12th IWA Leading Edge Conference on Water and Wastewater Technologies

(30 May 2015 - 3 June 2015, Hong Kong, China)

Website: <http://let2015.org/>

Important dates:

Notification of acceptance/rejection - 15 December 2014

Deadline for poster/platform presenters' registration - 15 April 2015

Early Bird Registration before 15 April 2015

Submission of digital poster file - 15 April 2015

Deadline for full paper submission - 30 May 2015

The 12th IWA Leading Edge Conference on Water and Wastewater Technologies is designed to be the place where new ideas are introduced and the opportunity is provided to interact with the “best of the best”. Hong Kong, a world unique and dynamic Asian city not only showcases mega scale practice of integrated dual water management, but also presents the latest development of new wastewater treatment technology from pilot to full scale.

For those who are looking to introduce new ideas and concepts, and those looking for them, this is the one conference of the year that should not be missed. We welcome you to join us in Hong Kong in 2015 to come to present and to learn about the latest on water and wastewater technology.

Conference Themes:

Alternative water sources

Direct Potable Reuse

E-technology in urban water management

Granular sludge processes

Integrated chemical and biological treatment

Resource Recovery from Wastewater

Treating Complex Industrial Wastewaters

Water Technology for Densely Populated and Rapidly Growing Cities

Contact: let2015@iwahq.org

More information is available on: <http://www.iwahq.org/2mg/events/iwa-events/2015/let2015.html>

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7th International Conference on Porous Media & Annual Meeting

(May 18 - 21, 2015, Padova, Italy)

Website: <https://www.interpore.org/events/interpore-conference-programs/7th-international-conference-on-porous-media-annual-meeting>

The annual InterPore conference aims to unite people from diverse disciplines who study and work with porous media. From natural to industrial systems, porous media can be complex. The goal of the annual conference is to bring people together so they can exchange ideas and be made aware of each other's interests and research activities.

Abstract submission is open!

Deadline for abstract submission: Wed., 14 January, 2015

Accepted minisymposia have been announced!

Themes of the conference

General Themes

Fundamentals of Porous Media

Computational challenges in porous media simulation

Experimental Studies

Environmental, technical and biomedical applications involving porous media

Miscellaneous

Examples of Applications

Wicking in Textiles

Biological Tissues

Filters, Foams, and Membrane

Thin and Nanoscale Porous Media

Composites

Swelling Porous Media

CO₂ Sequestration, Petroleum Engineering

Groundwater, Biofilms

Ceramics and constructions materials

Fuel cells, batteries

Food, fibres, wood

The conference will be held in the historic and touristic city of Padova and the beautiful Venice is not far away.

Contact:

For matters related to the Local Organizing Committee (hotel and travel information, visa, venue, etc.):

conference2015@interpore.org

For all other matters (registration, minisymposia, abstract, program, short courses, etc.):

secretary@interpore.org

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Modelling roll waves with shallow water equations and turbulent closure

论文信息: Cao, Z.X., Hu, P.H., Hu, K. H., Pender, G., Liu, Q. Q. (2014). "Modelling roll waves with shallow water equations and turbulent closure." *Journal of Hydraulic Research*, International Association of Hydraulic Research, DOI: 10.1080/00221686.2014.950350.

全文地址: <http://www.tandfonline.com/doi/full/10.1080/00221686.2014.950350>

ABSTRACT: A physically enhanced model is proposed for roll waves based on the shallow water equations and $k \varepsilon$ turbulence closure along with a modification component. It is tested against measured data on periodic permanent roll waves, and the impact of turbulence is demonstrated to be essential. It is revealed that a regular inlet perturbation may lead to periodic permanent or natural roll waves, when its period is shorter or longer than a critical value inherent to a specified normal flow. While a larger amplitude or shorter period of a regular inlet perturbation is conducive to the formation of periodic permanent roll waves, their period remains the same as that of the perturbation, while their amplitude increases with the perturbation period and is independent of the perturbation amplitude. An irregular inlet perturbation favours the formation of natural roll waves, so does a larger amplitude of the perturbation.

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Changes in the critical erosion velocity for sediment colonized by biofilm

论文信息: Fang HW, Shang QQ, Chen MH, He GJ. Changes in the critical erosion velocity for sediment colonized by biofilm. *Sedimentology*, 2014, 61(3), 648-659. doi: 10.1111/sed.12065.

全文地址: <http://onlinelibrary.wiley.com/doi/10.1111/sed.12065/abstract>

ABSTRACT: In flowing water the incipient motion of sediment can be affected by the presence of microbial biofilm growth. This article documents a series of flume experiments using non-uniform sediments, in which sediment entrainment was investigated for cases where the sediment was immersed in deionized water, so that no biofilm developed, and for cases where a bio-sediment was cultivated by placing the sediment in a mixture of natural water and nutrient solution. Differences in entrainment and the velocity at incipient motion were measured over an eight week period, as biofilm grew. It was found that the incipient motion phenomena were quite distinct between the two kinds of sediment. Sediment with biofilm was more stable and, over time, incipient velocity increased to a threshold level, before declining. Biofilm development is clearly an important control on the stability of sediments, especially in eutrophic water bodies. Two incipient velocity formulas were derived for sliding and rolling conditions. Film water theory was utilized to describe the cohesive force between sediment particles and the adhesive force generated by biofilm was introduced into the formula derivation; the time variation characteristics of biofilm strength and the features of the substrate were also taken into consideration. Such analyses can help to predict sediment transport changes due to biofilm presence in nutrient-rich water bodies.

学术期刊

Journal of Hydrology, Volume 519 Part B

The impact of climate change, human interference, scale and modeling uncertainties on the estimation of aquifer properties and river flow components

Assessing the impact of travel time formulations on the performance of spatially distributed travel time methods applied to hillslopes

Soil freezing and thawing processes affected by the different landscapes in the middle reaches of Heihe River Basin, Gansu, China

Spatial and temporal variability of winter streamflow over Romania and its relationship to large-scale atmospheric circulation

Impacts of elevated CO₂, climate change and their interactions on water budgets in four different catchments in Australia

Interactions of soil water content heterogeneity and species diversity patterns in semi-arid steppes on the Loess Plateau of China

A new technique to map groundwater recharge in irrigated areas using a SWAT model under changing climate

Predictability of low flow – An assessment with simulation experiments

A comparative appraisal of hydrological behavior of SRTM DEM at catchment level

Projected groundwater balance as a state indicator for addressing sustainability and management challenges of overexploited crystalline aquifers

A perturbation approach for assessing trends in precipitation extremes across Iran

Post-wildfire recovery of water yield in the Sydney Basin water supply catchments: An assessment of the 2001/2002 wildfires

Streambed temperature dynamics and corresponding heat fluxes in small streams experiencing seasonal ice cover

A framework to quantify GCM uncertainties for use in impact assessment studies

In situ measured and simulated seasonal freeze–thaw cycle: A 2-year comparative study between layered and homogeneous field soil profiles

Assessment of land surface model uncertainty: A crucial step towards the identification of model

weaknesses

Prospecting for groundwater discharge in the canals of Bangkok via natural radon and thoron

The effects of long-term drainage and subsequent restoration on water table level and pore water chemistry in boreal peatlands

A conservative flow routing formulation: Déjà vu and the variable-parameter Muskingum method revisited

Assessing the potential global extent of SWOT river discharge observations

Urbanization and watershed sustainability: Collaborative simulation modeling of future development states

A multivariate comparison of the BERMS flux-tower climate observations and Canadian Coupled Global Climate Model (CGCM3) outputs

Risk assessment for transboundary rivers using fuzzy synthetic evaluation technique

Catchments as heterogeneous and multi-species reactors: An integral approach for identifying biogeochemical hot-spots at the catchment scale

Assessment of water constituents in highly turbid productive water by optimization bio-optical retrieval model after optical classification

Time-stability of soil water through boreal (60–68°N) gradient

Years are not brothers: Two-year comparison of greenhouse gas fluxes in large shallow Lake Võrtsjärv, Estonia

Radar rainfall estimation for the identification of debris-flow occurrence thresholds

Comparison of surface and groundwater balance approaches in the evaluation of managed aquifer recharge structures: Case of a percolation tank in a crystalline aquifer in India

Using Isomap to differentiate between anthropogenic and natural effects on groundwater dynamics in a complex geological setting

An analytical framework for quantifying aquifer response time scales associated with transient boundary conditions

A laboratory method to determine the hydraulic conductivity of mountain forest soils using undisturbed soil samples

Modelling impacts of regulation on flows to the Lowbidgee floodplain of the Murrumbidgee River, Australia

Correcting bias in radar Z–R relationships due to uncertainty in point rain gauge networks

Laboratory assessment of the mobility of water-dispersed engineered nanoparticles in a red soil (Ultisol)

Conjunctive use of water resources for sustainable irrigated agriculture

Sand mining and increasing Poyang Lake's discharge ability: A reassessment of causes for lake decline in China

Effect of multiple lateral cavities on stream solute transport under non-Fickian conditions and at the Fickian asymptote

Assessing the impacts of climate change on river flows in England using the UKCP09 climate change projections

Practical limitations on the use of diurnal temperature signals to quantify groundwater upwelling

Characterizing land use impact on multi-tracer displacement and soil structure

Estimation of regional snowline elevation (RSLE) from MODIS images for seasonally snow covered mountain basins

Runoff coefficient and average yearly natural aquifer recharge assessment by physiography-based indirect methods for the island of Sardinia (Italy) and its NW area (Nurra)

Mass-time and space-time fractional partial differential equations of water movement in soils: Theoretical framework and application to infiltration

Spatially heterogeneous drought analysis theory and future trends

Suspended sediment dynamics in a Southeast Asian mountainous catchment: Combining river monitoring and fallout radionuclide tracers

Improving real-time estimation of heavy-to-extreme precipitation using rain gauge data via conditional bias-penalized optimal estimation

First-passage time criteria for the operation of reservoirs

Assessment of interbasin groundwater flows between catchments using a semi-distributed water balance model

An integrated modeling system for estimating glacier and snow melt driven streamflow from remote sensing and earth system data products in the Himalayas

Hyporheic zone exchange fluxes and residence times inferred from riverbed temperature and radon data

Nitrous oxide as an indicator of nitrogen transformation in a septic system plume

Modelling of dissolved oxygen in the Danube River using artificial neural networks and Monte Carlo Simulation uncertainty analysis

Influence of gravel mulch stratum thickness and gravel grain size on evaporation resistance

Reconstructing flash flood magnitudes using ‘Structure-from-Motion’: A rapid assessment tool

Isotopic features of Emilia-Romagna region (North Italy) groundwaters: Environmental and climatological implications

Groundwater level response in U.S. principal aquifers to ENSO, NAO, PDO, and AMO

Evolution of the hydro-climate system in the Lake Baikal basin

Analysis of the temperature dynamics of a proglacial river using time-lapse thermal imaging and energy balance modeling

Analytical solution for scalar transport in open channel flow: Slow-decaying transient effect

Variation in suspended sediment yield across the UK – A failure of the concept and interpretation of the sediment delivery ratio

Multi-scale streambed topographic and discharge effects on hyporheic exchange at the stream network scale in confined streams

Quantifying detachment rate of eroding rill or ephemeral gully for WEPP with flume experiments

Turbidity-based sediment monitoring in northern Thailand: Hysteresis, variability, and uncertainty

A nonstationary index-flood technique for estimating extreme quantiles for annual maximum streamflow

Combined uncertainty of hydrological model complexity and satellite-based forcing data evaluated in two data-scarce semi-arid catchments in Ethiopia

Evapotranspiration and crop coefficients for a super intensive olive orchard. An application of SIMDualKc and METRIC models using ground and satellite observations

SWAT hydrologic model parameter uncertainty and its implications for hydroclimatic projections in snowmelt-dependent watersheds

Stable isotopic composition of near surface atmospheric water vapor and rain–vapor interaction in Taipei, Taiwan

A simulation study of reactive flow in 2-D involving dissolution and precipitation in sedimentary rocks

Water pollution risk simulation and prediction in the main canal of the South-to-North Water Transfer Project

High-resolution moisture profiles from full-waveform probabilistic inversion of TDR signals

Effective discharge in Rocky Mountain headwater streams

Water balance along a chain of tundra lakes: A 20-year isotopic perspective

Meltwater chemistry and solute export from a Greenland Ice Sheet catchment, Watson River, West Greenland

Throughfall heterogeneity in tropical forested landscapes as a focal mechanism for deep percolation

Establishing a sediment budget for a small agricultural catchment in southern Brazil, to support the development of effective sediment management strategies

Improvement and comparison of likelihood functions for model calibration and parameter uncertainty analysis within a Markov chain Monte Carlo scheme

A dry zone-wet zone based modeling of surface water and groundwater interaction for generalized ground profile

Regionalization of hydrologic response in the Great Lakes basin: Considerations of temporal scales of analysis

Insights on geologic and vegetative controls over hydrologic behavior of a large complex basin – Global Sensitivity Analysis of an integrated parallel hydrologic model

Using tree ring data as a proxy for transpiration to reduce predictive uncertainty of a model simulating groundwater–surface water–vegetation interactions

Impact of various surface covers on water and thermal regime of Technosol

Application of the water table fluctuation method for estimating evapotranspiration at two phreatophyte-dominated sites under hyper-arid environments

Modelling sub-daily latent heat fluxes from a small reservoir

Estimating long-term changes in actual evapotranspiration and water storage using a one-parameter model

Quantification of submarine/intertidal groundwater discharge and nutrient loading from a lowland karst catchment

Alternative least squares methods for determining the meteoric water line, demonstrated using GNIP data

Effects of sand burial on dew deposition on moss soil crust in a revegetated area of the Tennger Desert, Northern China

Saltwater wedge variation in a non-anthropogenic coastal karst aquifer influenced by a strong tidal range (Burren, Ireland)

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