行政院國家科學委員會補助國內專家學者出席國際學術會議
申請書

申請條碼： 101BFA0100305

一、基本資料：

申請人姓名	吳清森		職稱	研究助理(博士級)
機關名稱	國立臺灣大學土木工程學系暨研究所			
會議名稱	The 4th Asia-Pacific International Conference on Computational Methods in Engineering 2012			
會議時間	自民國 101 年 12 月 12 日起至民國 101 年 12 月 14 日			
會議地點	國家	日本	州、城市	京都
會議主辦機構	Kyoto University			
擬發表之論文題目	中文名稱：含碎波的自由液面流之數值模擬 英文名稱：A numerical study of breaking free-surface flows (如為本會專題研究計畫之成果，請列出計畫編號) 計畫編號：99-2221-E-002-089-MY3 計畫名稱：橋梁一般沖刷與局部侵蝕在沖積河川之研究 計畫主持人或共同主持人：楊德良			
論文歸屬處別	工程處		論文學門名稱	水利工程
論文發表方式	□ Keynote Speaker □Invited Speaker □Session Chairman ■Oral □Poster □Other ：			
會議之性質及其學術地位、重要性	Computational methods have been playing crucial roles in diverse fields such as mechanical, civil, architectural, electrical and electronic engineering as well as in science. The Japan-China Symposia on Boundary Element Methods (1987, 1988, 1990, 1991, 1993, 1994, 1996, 1998) held in Japan and China, First Pan-Pacific Conference on Computational Engineering (PCCE93, 1993) in Seoul Korea, and the Asia-Pacific International Conferences in Computational Methods in Engineering (2003 in Sapporo Japan, 2006 in Hefei China, 2009 in Nanjing China) have made substantial contribution to computational methods. It is our great pleasure to announce that the Fourth Asia-Pacific International Conference in Computational Methods in Engineering 2012 (ICOME2012) will be held in Kyoto, Japan, following these successful previous conferences. The aim of this conference is to discuss newest achievements of computational methods in different fields of engineering and science. Emphasis is placed on fundamentals as well as on applications related to the latest developments of computational methods.			
申請補助之預算	■ 機票費：NT 15,000 ■註冊費：NT 3,000 □手續費：NT 0 □保險費：NT 0 ■生活費：NT 26,546			

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其　　他	□ 申請人為重度殘障者(若為重度殘障者，可申請一名看護人員之旅費)

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18 Sept., 2012

Prof. Ching-Sen Wu
Dept. Civil Engineering,
National Taiwan University
Taipei
Taiwan
email: oliverscswu@ntu.edu.tw

Dear Prof. Ching-Sen Wu,

It is my pleasure to inform you that your abstract entitled "A numerical study of breaking free-surface flows" has been accepted for presentation in The fourth Asia-Pacific International Conference on Computational Methods in Engineering (ICOME 2012) to be held in Kyoto University, Japan, from 12 to 14, December, 2012. I would like to invite you to attend this conference and give a talk.

We look forward to welcoming you in Kyoto.

Sincerely yours,

Naoshi Nishimura

Naoshi Nishimura
Chair of ICOME2012 and Professor
Department of Applied Analysis and Complex Dynamical Systems,
Graduate School of Informatics,
Kyoto University, Kyoto 606-8501
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A numerical study of breaking free-surface flows

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Key words: *Navier-Stokes equations, interface tracking, volume-of-fluid method, liquid breaking*

Abstract

In this work we present a practical interface tracking algorithm to study the interfacial flow problems which are applicable to some hydrodynamic problem with liquid-breaking effect. The developed numerical model consists of the calculations of fluid motions and the predictions of free surface. The fluid motion is governed by the classical, incompressible Navier-Stokes (NS) equations. To track the free-surface movements, an improved volume-of-fluid (VOF) algorithm is employed. The VOF algorithm is composed of the centered column scheme based on the piecewise linear interface calculation (PLIC) concept and the Lagrangian split advection scheme. This improved advection algorithm is used to capture the interface of the immiscible fluids both in 2D and 3D spaces. Then the proposed numerical model, combination of the PLIC-VOF scheme and the NS system, is applied to study some physical problems with the liquid-breaking effects. They are the simulations of plunging breaking wave, gravity wave and collapse of a liquid column. Some phenomena of the wave-breaking problems are captured, such as the overturning, splash up and gas entrainment beneath the surface. It is significant to note that the proposed numerical model can be accurately accomplished by a regular structured mesh without any geometric modifications. Next, the mass conservation is numerically assessed, thus allowing computations to reach the machine precision. Good results are obtained through numerical tests.

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行政院國家科學委員會個人資料表

以下各項資料均將收錄於國科會資料庫內，其中有關個人的姓名、服務機關、連絡電話（公）及論文著述等，將公開於本會網際網路「研究人員」項下，提供外界查詢。至於其他如傳真、 E-mail 、學歷、經歷、專長等資料，為尊重個人意願，請圈選（同意、不同意）於網際網路上提供外界查詢。（如以往已經表示過意見者，可不必再勾選）。

一、基本資料

身份證號碼	*******134				
中文姓名	吳清森	英文姓名	Ching-Sen Wu		
國　　籍	中華民國	性　　別	男	出生日期	1980 年 07 月 19 日
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二、主要學歷 由最高學歷依次填寫，若仍在學者，請在學位欄填「肄業」 。

學校名稱	國別	主修學門系所	學位	起訖年月(西元年/月)
國立台灣大學	中華民國	土木工程學系暨研究所	博士	2007/08 至 2012/07
國立臺灣海洋大學	中華民國	河海工程學系暨研究所	碩士	2002/09 至 2004/06
逢甲大學	中華民國	土木工程學系	學士	1998/09 至 2002/06

三、現職及與專長相關之經歷 指與研究相關之專任職務，請依任職之時間先後順序由最近者往前追溯。

服務機構	服務部門／系所	職稱	起訖年月(西元年/月)
現職：國立臺灣大學	土木工程學系暨研究所	研究助理(博士級)	
經歷:台灣大學	水工試驗所	研究助理(碩士級)	2006/08 至 2007/07

四、專長 請自行填寫與研究方向有關之學門及次領域名稱。

1.　計算力學	2.	3.	4.
5.	6.	7.	8.

吳清森

著作目錄

期刊論文

1.C. S. Wu, D. L. Young and C. L. Chiu, "Simulation of Wave-Structure Interaction by Hybrid Cartesian/Immersed Boundary and Arbitrary Lagrangian-Eulerian Finite Element Method", Journal of Computational Physics, 2012,06.(SCI)

2.C. S. Wu and D. L. Young, "Simulation of wave-structure interaction problem by a strong coupling partitioned approach", Computers & Fluids, 2012,06.(SCI)

3.C. S. Wu, D. L. Young, "Interface reconstruction with split Lagrangian advection for two-dimensional interfacial flows", Journal of Mechanics, 2012,06.(SCI)

4.C. S. Wu, D. L. Young, H. C. Wu, "Simulations of multidimensional interfacial flows by an improved volume-of-fluid method", International Journal of Mass and Heat Transfer, 2012,06.(SCI)

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六、研發成果智慧財產權及其應用績效：

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