

## Civil Engineering Abstracts

### FILE DESCRIPTION

**Civil Engineering Abstracts** provides indexing and abstracting coverage of the world's technical literature in civil engineering. Also covered are the complementary fields of forensic engineering, management and marketing of engineering services, engineering education, theoretical mechanics and dynamics, and mathematics and computation. Over 3,000 serial titles published worldwide are covered as well as conference proceedings, books and monographs, and dissertations.

### SUBJECT COVERAGE

Major areas of coverage include:

- Buildings, towers, and storage tanks
- Bridges and tunnels
- Cartography and topology
- Civil engineering
- Coastal and offshore structures
- Construction materials selection
- Design and properties of substructures
- Geotechnical engineering
- Forensic engineering
- Land development, irrigation, and drainage
- Management, marketing, and education
- Mathematics and computation
- Pollution and conservation
- Seismic engineering
- Site remediation and reclamation
- Storm water management and flood analysis
- Surface and groundwater hydrology
- Surveying and satellite communications
- Theoretical mechanics and dynamics

### SOURCES

The Civil Engineering Abstracts database includes information abstracted from over 3,000 scientific and technical journals, patents, government reports, conference proceedings, dissertations, books, and other publications. The database corresponds to the print *Civil Engineering Abstracts*.

### TIPS

#### USE FILE 61

to search for all information relating to civil engineering topics.

#### USE /TI AND /DE

for precise subject searching:

S FLOOD(W)MANAGEMENT/TI,DE

#### USE SUBJECT HEADINGS or

#### SUBJECT HEADING CODES

to narrow a search to a topic.

S SH="MATHEMATICS AND  
COMPUTATION"

S SC=63

#### USE RANK

to find experts working in an area of interest.

S STRESS ANALYSIS  
RANK AU

### DIALOG FILE DATA

Inclusive Dates: 1966 to the present

Update Frequency: Monthly

File Size: Over 427,507 records as of July 2005

### CONTACT

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## SAMPLE RECORD

DIALOG(R)File 61:Civil Engin. Abs.  
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0000040870 IP ACCESSION NO: 200504-63-09686

**/TI** Extended immersed boundary method using FEM and RKPM  
**AU=** Wang, Xiaodong; Liu, Wing Kam  
**CS=** Department of Mechanical Engineering, Polytechnic University, Brooklyn, NY  
11201, USA

**JN=,SO=** Computer Methods in Applied Mechanics and Engineering, v 193, n 12-14,  
**PD=** p 1305-1321, 26 Mar. 2004  
**PY=** PUBLICATION DATE: 2004  
**PU=** PUBLISHER: Elsevier Science Publishing Co., Inc., P.O. Box 882, Madison  
Square Station, New York, NY, 10159-0882  
**CP=** COUNTRY OF PUBLICATION: USA  
PUBLISHER URL: <http://www.elsevier.com>  
PUBLISHER EMAIL: [usinfo-f@elsevier.com](mailto:usinfo-f@elsevier.com)

**DT=** DOCUMENT TYPE: Journal Article  
**RT=** RECORD TYPE: Abstract  
**LA=** LANGUAGE: English  
**SN=** ISSN: 0045-7825  
NOTES: Graphs  
NO. OF REFS.: 23  
DOI: 10.1016/j.cma.2003.12.024

**FS=** FILE SEGMENT: Civil Engineering Abstracts

**/AB** ABSTRACT:  
The proposed extended immersed boundary method (EIBM) has several distinct features in comparison with the immersed boundary (IB) method. In the IB method, the interaction between the immersed elastic boundary and the surrounding viscous fluid is replaced with an equivalent body force distribution within the fluid domain. The key ingredient of the IB method is the enforcement of the energy input from the equivalent body force into the fluid domain to be the same (at all time) as that of the elastic forces within the IB. In EIBM, instead of the volumeless immersed elastic boundary, we consider the submerged elastic solid which occupies a finite volume within the fluid domain. In particular, we replace the kinematic and dynamic matching of the fluid-solid interface and the effect of the submerged solid with a judiciously chosen collection of equivalent nodal forces calculated in the context of finite element formulations. The employment of the finite element representation enables a realistic stress analysis for the submerged solid subject to large deformations. Finally, in EIBM, we also replace the discretized delta function commonly used in the IB method with the kernel functions in meshless reproducing kernel particle method (RKPM). With this improvement, using the same finite support domain, we could improve the discretized delta function from C' to C" continuity, where n is chosen according to the required smoothness and resolution of such functions, and more importantly, enables the use of non-uniform meshing in the fluid domain. These extensions may eventually open doors to the modelling of complex biological fluid involving molecular, cellular, and flexible vessel-flow interactions.

**/DE** DESCRIPTORS: Mathematical models; Boundaries; Fluids; Mathematical analysis;  
Computational fluid dynamics; Fluid flow; Finite element method;  
Equivalence; Delta function; Ingredients; Smoothness; Meshless methods;  
Kinematics; Force distribution; Engineering; Stress analysis  
Employment; Extensions

**SC=,SH,SH=** SUBJ CATG: 63, Mathematics and Computation

## SEARCH OPTIONS

## BASIC INDEX

SEARCH SUFFIX	DISPLAY CODE	FIELD NAME	INDEXING	SELECT EXAMPLES
—	—	All Basic Index Fields	Word	S IMMERSSED(W)BOUNDARY
/AB	AB	Abstract	Word	S VISCOUS(W)FLUID/AB
/DE	DE	Descriptor <sup>1</sup>	Word & Phrase	S STRESS(W)ANALYSIS/DE S FLUID FLOW/DE
/ID	ID	Identifier	Word & Phrase	S EXTRUSION/ID S HEAT TRANSFER/ID
/SH	SH	Subject Category <sup>2</sup>	Word	S MATHEMATICS(1W)COMPUTATION/SH
/TI	TI	Title	Word	S IMMERSSED(W)BOUNDARY(W)METHOD/TI

<sup>1</sup> Also /DF.

<sup>2</sup> Searchable in the Basic Index and in the Additional Indexes.

## ADDITIONAL INDEXES

SEARCH PREFIX	DISPLAY CODE	FIELD NAME	INDEXING	SELECT EXAMPLES
AA=	AA	CSA Accession Number	Phrase	S AA=200504-63-09686
AU=	AU	Author	Phrase	S AU=WANG, X?
—	AZ	DIALOG Accession Number		
BN=	BN	International Standard Book Number (ISBN)	Phrase	S BN=0-8194-5260-2 S BN=0819452602
CD=	CD	Conference Date	Phrase	S CD=20040300
CL=	CL	Conference Location	Word	S CL=(SAN(W)JOSE)
CP=	CP	Country of Publication	Phrase	S CP=USA S CP=NEW ZEALAND
CS=	CS	Corporate Source	Word & Phrase	S CS=(MECHANICAL(S)ENGINEERING) S CS=DEPARTMENT OF MECHANICAL?
CT=	CT	Conference Title	Word	S CT=(ULTRAFAS(T)W)PHENOMENA
CY=	CY	Conference Year	Phrase	S CY=2004
DT=	DT	Document Type	Phrase	S DT=JOURNAL ARTICLE?
FS=	FS	File Segment	Phrase	S FS=CIVIL ENGINEERING ABSTRACTS
—	II	Digital Object Identifier		
JN=	JN	Journal Name	Phrase	S JN=COMPUTER METHODS?
LA=	LA	Language	Phrase	S LA=GERMAN
MC=	MC	Materials Classification	Phrase	S MC=ALUMINUM BASE ALLOY?
ML=	ML	Materials	Phrase	S ML=AL-4CU
NO=	NO	Document Number	Word & Phrase	S NO=SPIE S NO=SPIE-2506
—	NR	Number of References		
—	NT	Note		
PD=	PD	Publication Date	Phrase	S PD=20040326
PU=	PU	Publisher	Word	S PU=(ELSEVIER(W)SCIENCE)
PY=	PY	Publication Year	Phrase	S PY=2004
RN=	RN	Report Number	Word & Phrase	S RN=5383 S RN=SPIE VOLUME 5383
RT=	RT	Record Type	Phrase	S RT=ABSTRACT
SC=	SC	Subject Category	Phrase	S SC=63
SH=	SH	Subject Category Text <sup>2</sup>	Phrase	S SH="MATHEMATICS AND COMPUTATION"
SN=	SN	International Standard Serial Number (ISSN)	Phrase	S SN=0045-7825
SO=	SO	Source Information	Word	S SO=(APPLIED(W)MECHANICS)
UD=	—	Update	Phrase	S UD=9999

**SPECIAL FEATURES**

For command descriptions, enter HELP LIMIT, HELP SORT, HELP RANK, HELP DUP, HELP CURRENT online.

<b>LIMIT</b>	/ABS -- Record has an Abstract /NOABS -- Record is a Citation Only Record /YYYY -- Publication Year	S S3/ABS S S3/NOABS S S2/2004
<b>SORT</b>	AA, AU, CS, JN, PY, TI	SORT S3/ALL/PY/D SORT S1/ALL/TI
<b>RANK</b>	All phrase- and numeric-indexed fields in the Additional Indexes can be ranked.	RANK DE RANK AU S4
<b>RD, ID</b>	Remove duplicates (RD) or identify duplicates (ID,IDO).	RD S5
<b>CURRENT</b>	Search only the most recent year plus one (CURRENT1) to five (CURRENT5) years.	B 61 CURRENT2

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NO.	DIALOGWEB FORMAT	RECORD CONTENT
1	--	DIALOG Accession Number
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3	Medium	Bibliographic Citation
4	--	Full Record with Tagged Fields
5	--	Full Record
6	Short	Title and Publication Year
7	Long	Bibliographic Citation and Abstract
8	Free	Title, Indexing, and Publication Year
9	Full	Full Record

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For an explanation, enter HELP TYPE, HELP UDF, HELP TAG online.

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