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Administrative report: TC2 – Physical modelling in geotechnics

Compte rendu sur la CT-2

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1 INTRODUCTION

Dr Ryan Phillips of C-CORE, University of Newfoundland, Canada chaired the Committee till July 2002 after which Colin Leung took over the chairmanship. The name of the Committee was “Geotechnics of Physical Modelling and Centrifuge Testing”. During a committee meeting in July 2002, it was resolved that the Committee to be renamed “Physical Modelling in Geotechnics”. The name change was subsequently approved by the ISSMGE President.

2 TERMS OF REFERENCE

The terms of reference for the Committee are as follows:

- 1) To focus on the geotechnics of physical modelling and to promote interaction among modellers including calibration chamber testing for soil parameters research, pressure chamber testing, shaking table and centrifuge model testing.
- 2) To promote publications of papers that are useful to geotechnical practice in international journals and conferences and to establish the International Journal of Physical Modelling in Geotechnics as the major platform for interaction among physical modellers and a useful source of reference for geo-technical engineers.
- 3) To promote interaction with other TCs such as the newly proposed TC on the observational method and to encourage jointly organised technical sessions with other TCs at international and regional conferences and meetings.
- 4) To act as contact persons and as a resource centre on geotechnical physical modelling.
- 5) To support, participate and encourage the organisation of international, regional and national events on geotechnical physical modelling and to organise specialty sessions at major international and regional conferences such as the regional conferences in 2003 and the International ISSMGE conference in 2005.
- 6) To promote the organisation of the next TC2 international conference on Geotechnical Physical Modelling to be held in Hong Kong in 2006.

3 MEMBERSHIP

The membership of TC2 comprises 31 committee members from 22 countries. The list of members is given as follows:

Table 1: List of committee members

Name	Affiliation
Colin C. F. Leung *(Chair)	National University of Singapore, Singapore
R. Phillips *(Immediate past-chair)	C-CORE, Canada
C. W. W. Ng *(Secretary)	Hong Kong University of Science and Technology, Hong Kong
O. Kusakabe*	T.I.T., Japan
S. Springman*	ETHZ, Switzerland
B. Kutter*	University of California, Davis, USA
H. Allersma	University of Delft, The Netherlands
W.F. Anderson	University of Sheffield, UK
R. Azevedo	Brazil
G. Bagge	Technical University of Denmark, Denmark
Z.B. Bainatov	Kazakhstan Academy of Transport & Communication, Kazakhstan
B. Caicedo	Universidad de Los Andes, Columbia
P. Croce	Italy
P. J. Culligan	MIT, USA
M.C.R. Davies	University of Dundee, UK
V. Fioravante	Italy
J. Garnier	LCPC Nantes, France
D. Goodings	University of Maryland, USA
S.W. Jacobsz	South Africa
D. König	Ruhr Universitaet Bochum, Germany
M. Okamura	PWRI, Japan
J. Portugal	LCPC Lisboa, Portugal
M. Randolph	University of Western Australia, Australia
J.F. Semblat	France
A.L. Simonelli	Italy
G. Telekes	Hungary
B. Teymur	Istanbul Technical University, Turkey
A.J. Valsangkar	University of New Brunswick, Canada
V.V. Vinogradov	Moscow State Railway University, Russia
B.S. Viswanatham	IIT Bombay, India
T.G. Yakovleva	Moscow State Railway University, Russia

* core members

4 ACTIVITIES COMPLETED/ON-GOING

The key TC2 events for the period 2001 to 2005 are highlighted as follows:

4.1 *Committee Meetings*

Three committee meetings were held to update all members on past and on-going TC2 activities and discuss action plans for future TC2 activities. The first meeting was held in Istanbul, Turkey, during the ISSMGE Conference in August 2001 and chaired by Dr Ryan Phillips. Dr Colin Leung chaired the 2nd meeting held during the TC2 Conference in St John's, Canada, in July 2002 and the 3rd meeting during the European Regional Conference in Prague, Czech Republic, in August 2003. There were constructive interactions at these meetings and good turnout, with at least 15 members present at each of these meetings.

Some TC2 members also gathered for informal discussions at the Pan-American Regional Conference in Boston, USA, in June 2003 and at the Asian Regional Conference in Singapore in August 2003. The next TC2 meeting is scheduled at the ISSMGE Conference in Osaka, Japan, in September 2005.

4.2 *TC2 Conference on Physical Modelling in Geotechnics July 2002*

The highlight of the TC2 events in this quadrennial was the TC2 conference held in St John's, Canada, from 10 to 12 July 2002. In the past, TC2 had organised conferences focusing on centrifuge modelling. The centrifuge conference series started off with 3 regional symposia held in UK, Japan and US in 1984. The first international conference on Centrifuge Modelling was held in Paris, France, in 1988; with subsequent Centrifuge conferences held in Boulder, USA, in 1991; Singapore in 1994; and Tokyo, Japan, in 1998.

With the expansion of the TC2 charter to include geotechnical physical modelling, the first conference on Physical Modelling in Geotechnics was held in Canada in 2002. The conference was highly successful with the attendance of over 200 centrifuge and non-centrifuge modellers and 160 papers presented at the conference. These papers represented work from 27 countries and 5 continents around the world. Moreover, the four keynote papers were delivered by Dr Suzanne Lacasse (Norway/Canada) on "Physical modelling in offshore geotechnics", Dr Jacques Garnier (France) on "Properties of soil samples used in centrifuge models", Professor Richard Bathurst (Canada) on "Physical modelling of geosynthetic walls and embankments", and Professor Osamu Kusakabe (Japan) on "Modelling of soil improvement methods in soft clay". The conference also included reports from the Network of European Centrifuge for Environmental Research (NECER), a Research Network of the European Commission, and the Network for Earthquake Engineering Simulation (NEES) of the US National Science Foundation. The conference was preceded by a one-day workshop on the use of physical modelling in education.

4.3 *TC2 Technical Sessions*

TC2 had also organised or were closely linked to the following technical sessions and symposium.

a) TC2 Workshop in Istanbul August 2001

A workshop on Geotechnical Physical Modelling on 28 August 2001 was held within the 15th International Conference on Soil Mechanics and Geotechnical Engineering in Istanbul, Turkey. The workshop was chaired by Dr Colin Leung. Invited speakers included Prof. Malcolm Bolton of UK, Prof. Mark Randolph of Australia and Prof. S Iai of Japan. Using illustrative examples

from their own research studies, the first 2 speakers highlighted the importance and benefits of centrifuge modelling in geotechnical practice. On the other hand, Prof. Iai touched on the scaling laws and advantages of large scale shaking table tests in the study of dynamic geotechnical problems.

b) International Symposium on Geotechnical Modelling and Networking Dec 2001

Profs. Charles Ng and Bruce Kutter jointly organised the above symposium at the Hong Kong University of Science and Technology from 8 to 9 December 2001. The symposium was funded by the Croucher Foundation of Hong Kong and the National Science Foundation of USA. The Symposium focused on the use and applications of centrifuge modelling and networking in the Pan-Pacific Region. Keynote lectures were delivered by Prof. Neil Taylor of UK and Dr Jacques Garnier of France. About 100 participants from different continents attended the Symposium. A highlight of the symposium was a special technical session conducted in Chinese for delegates who have difficulties in understanding English, with a view to spreading latest information, centrifuge modeling technology in the Chinese speaking world including the mainland and Taiwan.

c) TC2 Session at 12th Asian Regional Conference August 2003

TC2 organised a 2-hr technical session at the 12th Asian Regional Conference on Soil Mechanics and Geotechnical Engineering (12ARC) held in Singapore between 4 to 8 August 2003. The theme of the session was "Applications of Physical Modelling in Geotechnical Practice". A 30-minute theme lecture on the state-of-the-art application of centrifuge modelling in geotechnical engineering practice was delivered by Prof. Charles Ng (in collaboration with Prof. Osamu Kusakabe and Dr Colin Leung). In addition, 5 invited lectures were delivered by Prof. A B Huang of Taiwan, Dr M Kitazume of Japan, Prof. R N Taylor of UK and Dr B V Viswanadham of India. These speakers presented 1g and centrifuge model studies on various geotechnical topics.

d) International Workshop July 2001

An international workshop was conducted from 8 to 13 July 2001 in Ticino, Switzerland entitled 'Constitutive and Centrifuge Modelling in Geotechnics: two extremes'. Keynote lecturers hailed from both the centrifuge as well as the constitutive modelling communities and included Dr Ryan Phillips, Dr Jacques Garnier, Dr FH Lee, Prof. Malcolm Bolton, Prof. David Muir Wood, Prof. Carlo Viggiani, Dr Alessandro Gajo, Dr Ivo Herle, Dr Jitendra Sharma, Dr Jan Laue, Prof. Jean Sulem and other members of the TC2 committee attended (Dr Diethard Koenig, Prof. Michael Davies). Dr William Craig, Prof. Laurent Vulliet, Dr Andrzej Niemunis and Dr Diethard Koenig participated in a debate on the relevance of centrifuge modelling to design.

5 INTERNATIONAL JOURNAL OF PHYSICAL MODELLING IN GEOTECHNICS

Many TC2 members are involved in the core editorial group for the International Journal of Physical Modelling in Geotechnics. The Journal has been published since March 2001 and TC2 core member Prof Osamu Kusakabe of Japan is the Editor-in-Chief. Although there were difficulties in gathering paper contributions initially in 2001 and 2002, the Journal has since progressed well as there is now a constant stream supply of good quality papers submitted to the journal. In addition, the Journal is now included in the Emerald Index.

The Schofield Award was established to recognise the best papers published in the journal. The inaugural award was given to Dr U Klotz of Germany and Prof. Neil Taylor of UK for the

best paper published in the 2001 issues of the journal. The Award was given to the 2 authors during the TC2 session held in the Asian Regional Conference in Singapore in August 2003. Dr K Itoh and co-authors from Japan and Dr F K Gunzel of UK and co-authors from the NECER programme, Europe, won the Schofield Award for the best paper published in 2002 and 2003, respectively.

6 OTHER ACTIVITIES

a) TC2 web site

Dr H Allersma of the Netherlands maintained the TC2 web site that is linked to other sites including ISSMGE since 1999. TC2 Annual Re-ports, TC2 Physical Modelling Conferences, other TC2 sponsored conferences/symposia/workshops and Power-Point presentations are available for viewing at the TC2 web site. (<http://geo.citg.tudelft.nl/allersma/tc2/index.html>).

b) Scaling Law project

Dr Jacques Garnier of France and Dr D Koenig of Germany were tasked to carry out a project on the scaling laws for physical modelling of geotechnical problems. Preliminary discussions were held during the TC2 Committee meeting in Prague in August 2003. The project is still on-going.

c) Activities outside TC2

TC2 does not have any formal collaboration with other TCs. However, by virtue of the research areas of individual members, many members are actively involved in other geotechnical areas. They have published extensively in international journals and taken part actively in many other technical committee activities. Many informal interactions were made with other technical committees of ISSMGE. Examples included (i) Core Member Prof. Charles Ng has been invited to be the General Reporter at three major geotechnical conferences in Europe hosted by TC16, TC28 and TC29 in September 2004, September 2003 and October 2002, respectively. (ii) Both Profs. Charles Ng and Sarah Springman have been invited to give a joint state-of-the-art report at the TC6 Conference in Italy in June 2005. (iii) Core Member Prof Bruce Kutter of USA is actively involved in the Technical Committee on Earthquakes and Soil Dynamics, and (iv) Member Prof Mark Randolph of Australia will be organising a major offshore geotechnics conference in Perth in September 2005.

Prof. Sarah Springman chaired a lively session on physical and numerical modelling at the European Regional Conference in Soil Mechanics and Geotechnical Engineering in Prague in August 2003.

Prof. Sarah Springman also chaired the session on centrifuge modelling at the 8th International Conference on Permafrost in 2003 in Zurich (300 participants). The session on centrifuge modelling was planned and executed with significant interest from many countries, particularly from Russia, Canada, USA, central Europe, UK, Andean countries and those working in Antarctica and on Mars. TC2 member Prof. Michael Davies was one of the leading contributors.

7 FUTURE ACTIVITIES

a) Osaka ISSMGE Conference September 2005

TC2 members responded positively to the call for participation in technical sessions for the forthcoming ISSMGE Conference in Osaka, Ja-pan, to be held in September 2005. As a result, a good number of TC2 members had been proposed to take part in various technical sessions at the conference. Many members have since been chosen to perform important tasks at the con-

ference. These include (a) a keynote lecture to be delivered by Prof. Mark Randolph, (b) an invited lecture to be delivered by Dr Colin Leung, (c) general reports to be delivered by Profs. Osamu Kusakabe and Charles Ng. Other TC2 members were invited to be panelists for various technical sessions.

b) TC2 Conference on Physical Modelling in Geotechnics in August 2006

Prof. Charles Ng will organise the next TC2 conference in Hong Kong in August 2006. The conference is co-organised by the Hong Kong University of Science and Technology and the newly established Hong Kong Geotechnical Society where Charles Ng serves as the General Secretary. The conference is co-sponsored by the Association of Geotechnical Specialists (HK), the Geotechnical Engineering Office of the Civil Engineering and Development Department of the Hong Kong Special Administrative Region, the Geotechnical Division of the Hong Kong Institution of Engineers, the Hong Kong Polytechnic University, the Institution of Soil Mechanics and Geotechnical Engineering of the China Civil Engineering Society, the Southeast Asian Geotechnical Society and the University of Hong Kong. The second bulletin of the conference has been distributed and e-mailed worldwide, with the deadline for abstract dated 31 May 2005. A website has been set-up for the event: <http://www.gcf.ust.hk/gcf.htm>.

8 SUMMARY

TC2 has continued to be a very active committee. From 2001 to 2005, 3 committee meetings were held to review past activities and plan for future committee activities. The highlight of TC2 events is the International Conference on Physical Modelling in Geotechnics held in St John's, Canada, in July 2002. Dr Ryan Phillips was the key person responsible for this highly successful conference, which attracted over 200 delegates. The next TC2 conference will be held in Hong Kong in August 2006. During this period, TC2 also successfully organised 3 events: (a) a Workshop at the Istanbul ISSMGE Conference in July 2001, (b) an International Symposium in Hong Kong in December 2001 and (c) a Technical Session at the Asian Regional Conference in Singapore in August 2003.

Many TC2 members have been actively taken part in editorial activity of the International Journal of Physical Modelling in Geotechnics. The Journal Editor is TC2 Core Member Prof Osamu Kusakabe of Japan. The Journal is doing well with a steady stream of high quality papers submitted for publication and its inclusion in the Emerald Index. It has also set up the Schofield Award for the best papers published in the journal. So far, 3 papers had received the awards for papers published in 2001, 2002 and 2003, respectively.

By virtue of the research areas of individual members, many TC2 members are deeply involved in the activities of other technical committees. They are also well sought after to deliver keynote/invited presentations in major international geotechnical conferences worldwide. Not only is a Committee Meeting planned at the forthcoming ISSMGE Conference in Osaka in September 2005, many TC2 members will play key roles in various technical sessions at the conference.

TC2 is one of the oldest technical committee in ISSMGE. Since its establishment in the early 1980's, it had been very active in promoting geotechnical physical modelling having organised several major international conferences. Members had initiated and continue to manage the publication of the International Journal on Physical Modelling in Geotechnics. The current Committee strongly recommends to the next ISSMGE President that TC2 should continue to exist for the promotion of geotechnical physical modelling activities worldwide.