

Conference Agenda

WED 26 Aug	THU 27 Aug	FRI 28 Aug
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Daily Overview

Date: Thursday, 27/Aug/2026

9:00am - 10:30am	KS 02: Keynote lectures Location: POT 81 Session Chair: Enzo Martinelli Session Chair: Yvonne Ciupack Speakers: Jürg Röthlisberger and Michael Todd
10:30am - 11:00am	Coffee break Location: Exhibition and Catering Rooms: BEY E39, E26, 126
11:00am - 12:30pm	MS02-1: Innovative bonded solutions for steel structure repair and retrofit Location: BEY E17 Session Chair: Yvonne Ciupack Session Chair: Björn Abeln Session Chair: Matthias Albiez Session Chair: Angelo Savio Calabrese Session Chair: Pierluigi Colombi Session Chair: Elyas Ghafoori 7th Session Chair: Stammen, Elisabeth / TU Braunschweig, DE Meta-analysis of fatigue performance of centrally notched steel plates strengthened with CFRP Ciupack, Yvonne¹; Schramm, Clara²; Marx, Steffen² 1: TU Darmstadt, Germany; 2: TU Dresden, Germany; yvonne.ciupack@tu-dresden.de Static behavior of damaged steel beams repaired with CFRP plates bonded with toughened adhesives: experimental and analytical study Calabrese, Angelo Savio; Bocciarelli, Massimiliano; Colombi, Pierluigi Politecnico di Milano, Italy; angelosavio.calabrese@polimi.it Numerical investigation of the fatigue behavior of CFRP reinforced cracked steel beams Bocciarelli, Massimiliano; Calabrese, Angelo Savio; Colombi, Pierluigi Politecnico di Milano, Italy; pierluigi.colombi@polimi.it Adhesively bonded steel patches for retrofitting orthotropic bridge decks Abeln, Björn¹; Geßler, Achim¹; Stammen, Elisabeth²; Feldmann, Markus¹ 1: RWTH Aachen University, Germany; 2: TU Braunschweig, Germany; abeln@stb.rwth-aachen.de Influence of physical, creep, humid and coupled ageing on the evolution of the mechanical properties of a steel-to-steel bonded assembly in mode II FAWAZ, Arij¹; LEPRETRE, Emilie¹; CHAPELEAU, Xavier²; CHATAIGNER, Sylvain¹ 1: MAST/SMC, Université Gustave Eiffel, France; 2: COSYS/SII-I4S, Université Gustave Eiffel, France; sylvain.chataigner@univ-eiffel.fr Use of fiber optic sensors (FOS) for the monitoring of adhesively bonded steel laminates Stammen, Elisabeth¹; Grefe, Hinrich¹; Abeln, Björn²; Dilger, Klaus¹ 1: TU Braunschweig, Institute of Joining and Welding, Langer Kamp 8, 38106 Braunschweig, Germany; 2: RWTH Aachen University, Institute of Steel Construction, Mies-van-der-Rohe-Str.1, 52074 Aachen , Germany; abeln@stb.rwth-aachen.de
11:00am - 12:30pm	MS06-1: Monitoring, assessment and design of lightweight metal façades Location: BEY 245 Session Chair: Felicitas Rädcl Session Chair: Zbigniew Pozorski Session Chair: Markus Kuhnhenne The problem of load transfer in multi-layer façades Pozorski, Zbigniew Poznan University of Technology, Poland; zbigniew.pozorski@put.poznan.pl

	On the use of long, multi-span, thermally loaded sandwich façade panels Pozorska, Jolanta Poznan University of Technology, Poland; jolanta.pozorska@put.poznan.pl Determination of the shear properties of sandwich core materials Grimm, Sören Technical University of Applied Sciences Lübeck, Germany; soeren.grimm@th-luebeck.de Mechanical characterization of mineral core layer materials using digital image correlation Ruppert, Felix; Grzesiak, Szymon; Pahn, Matthias RPTU Kaiserslautern, Germany; felix.ruppert@rptu.de Optimization of metal cladding perforation and bending load capacity of sandwich panels Frackiewicz, Piotr¹; Pozorski, Zbigniew²; Jakimowicz, Marzena¹ 1: Instytut Techniki Budowlanej, Filtrowa 1, 00-611 Warszawa, Poland; 2: Poznań University of Technology, Jacka Rychlewskiego 1. 61-131 Poznań, Poland; p.frackiewicz@itb.pl Analysis of heat transfer through imperfect sandwich panel joints Chuda-Kowalska, Monika; Malendowski, Michał; Pozorski, Zbigniew Poznan University of Technology, Poland; monika.chuda-kowalska@put.poznan.pl
11:00am - 12:30pm	MS10-3: Advances and applications of vibration-based structural health monitoring Location: POT 112 Session Chair: Alvaro Cunha Session Chair: Carlos Moutinho Session Chair: Sergio Pereira Smartphone-assisted dynamic identification of infrastructures using scaled vehicles Masnata, Chiara; Pirrotta, Antonina University of Palermo, Italy; chiara.masnata@unipa.it Ambient vibration tests before, during and after rehabilitation – a case study Aldea, Alexandru¹; Enache, Ruxandra Gabriela¹; Bertrand, Etienne²; Nica, George-Bogdan¹; Ionica, Georgiana¹ 1: Technical University of Civil Engineering of Bucharest, Romania; 2: Gustave Eiffel University, France; george.nica@utcb.ro Updating the numerical model of the cable-stayed footbridge over the Wisłok River in Rzeszów Ziaja, Dominika¹; Błazik-Borowa, Ewa² 1: Rzeszow University of Technology, Poland; 2: Lublin University of Technology, Poland; dziaja@prz.edu.pl Integrated SHM of prestressed concrete bridges: a full-scale experimental campaign Mariani, Francesco¹; Ierimonti, Laura²; Castellani, Matteo¹; García-Macías, Enrique³; Casali, Leonardo⁴; Boccolini, Manuel⁴; Ubertini, Filippo¹; Venanzi, Ilaria¹ 1: University of Perugia, Italy; 2: University of Tuscia, Italy; 3: University of Granada, Spain; 4: Manini Prefabbricati s.p.a., Italy; francesco.mariani@dottorandi.unipg.it Dynamic monitoring of two similar bridges and preliminary results on knowledge transfer Avramova, Ana; Gentile, Carmelo Politecnico di Milano, Italy; ana.avramova@polimi.it Investigating the dynamic characteristics of a viaduct with steel orthotropic deck Calabrese, Angelo Savio¹; Gentile, Carmelo¹; Pagot, Riccardo² 1: Politecnico di Milano, Italy; 2: Autostrade Alto Adriatico S.p.A., Italy; angelosavio.calabrese@polimi.it
11:00am - 12:30pm	MS13-3: Intelligent digital methods for extending the service life of structures beyond 100 years Location: POT 51 Session Chair: Chongjie Kang Session Chair: Steffen Marx

Fatigue life prediction for steel bridges using digital twins and structural health monitoring

Brenner, Christoph; Muggenburg, Marc; Vogts, Stefan; Thiele, Klaus; Unglaub, Julian
Technische Universität Braunschweig, Institute of Steel Structures, Braunschweig, Germany;
christoph.brenner@tu-braunschweig.de

Service life prediction of reinforced concrete structures using 2D-FOS

Wellmann, Till; Becks, Henrik; Classen, Martin
Institute of Structural Concrete, RWTH Aachen University, Germany; twellmann@imb.rwth-aachen.de

Monitoring of chloride-induced corrosion in reinforced concrete beams under sustained load using embedded corrosion sensors and distributed fiber optic sensing

Macier, Maurice¹; Leusmann, Thorsten¹; Lowke, Dirk²
1: Technische Universität Braunschweig, Germany; 2: Technical University of Munich, Germany;
m.macier@ibmb.tu-bs.de

Analysis of German bridge inventory data for systematic recognition of damage patterns

Eisermann, Cedric; Vogt, Jakob; Walker, Maria; Marx, Steffen; Kang, Chongjie
TUD Dresden University of Technology, Germany; cedric.eisermann@tu-dresden.de

Assessing the value of monitoring for waterways infrastructure

Marsili, Francesca¹; Iannacone, Leandro²; Croce, Pietro³; Keßler, Sylvia¹
1: Helmut-Schmidt Universität / Universität der Bundeswehr Hamburg, Germany; 2: Lund University, Box 117, 221 00 Lund, Sweden; 3: University of Pisa, Largo Lucio Lazzarino 2, 56126 Pisa, Italy;
marsilif@hsu-hh.de

Strain distribution in stacked specimens under static and cyclic mechanical loading

Schiewe, Hanna¹; Markert, Martin¹; Birtel, Veit¹; Abubakar Ali, Mohamed²; Haist, Michael²
1: MPA Stuttgart, Germany; 2: University of Stuttgart, Germany; hanna.schiewe@mpa.uni-stuttgart.de

11:00am - 12:30pm

MS16-1: Carbon-negative compression dominant structures for decarbonized and deconstructable concrete buildings

Location: **BEY 117**
Session Chair: **Saim Raza**
Session Chair: **Moslem Shahverdi**
Session Chair: **Stijn Matthys**

CARBCOMN: advancing low carbon compression dominant structures

Matthys, Stijn¹; Van Titteboom, Kim¹; Shahverdi, Moslem²; Dell'Endice, Alessandro³;
Papanicolaou, Catherine Corina⁴; Ukrainczyk, Neven⁵; Hamaekers, Helen⁶; Megens, Johannes⁷;
Martilnelli, Enzo⁸; Bhooshan, Vishu⁹; Zillante, Lori¹⁰; Michels, Julien¹¹
1: Ghent University, Belgium; 2: Empa, Switzerland; 3: ETH Zürich, Switzerland; 4: University of Patras, Greece; 5: TU Darmstadt, Germany; 6: Orbix, Belgium; 7: Incremental3d, Austria; 8: TESIS, Italy;
9: Zaha Hadid Architects, UK; 10: Mario Cucinella Architects, Italy; 11: re-fer, Switzerland;
stijn.matthys@ugent.be

Carbonatable binders from waste: pathways toward sustainable construction materials

Gkournelos, Panagiotis; Karlos, Kyriakos; Papanicolaou, Catherine; Triantafyllou, Thanasis
University of Patras, Greece; pgkournelos@ac.upatras.gr

Carbon-negative mortar mixtures produced with fine recycled aggregates: the experience of CARBCOMN project

Lombardi, Rosario^{1,2}; Zohaib, Hassan³; Raza, Saim³; Pepe, Marco^{1,2}; Shahverdi, Moslem²;
Martinelli, Enzo^{1,2}
1: TESIS srl, Italy; 2: Department of Civil Engineering, University of Salerno, Italy; 3: EMPA, Switzerland;
r.lombardi@tesis-srl.eu

Mechanical behavior of 3D-printed slag-based formulations with methyl hydroxyethyl cellulose

Nguyen, Thinh¹; Lorika, Denis Ayena²; Hamaekers, Helen¹; Van Mechelen, Dirk¹; Zhang, Yi²; Van Tittelboom, Kim²; Matthys, Stijn²
1: Orbix Productions, Belgium; 2: Magnel-Vandepitte Laboratory, Department of Structural Engineering and Building Materials, UGent, Belgium; thinh.nguyen@orbix.be

CO2 transport in 3D-printed carbonatable slag-based mortars from micro-CT pore

	networks <u>Ukrainczyk, Neven</u>¹; Hassan, Zohaib^{2,3}; Parrilli, Annapaola²; Saim, Raza²; Shahverdi, Moslem²; Lorika, Denis, Ayena⁴; Zhang, Yi⁴; Koenders, Eduardus¹ 1: Institute of Construction and Building Materials, TU Darmstadt, Germany; 2: Swiss Federal Laboratories for Materials Science and Technology, Switzerland; 3: ETH Zürich, CH-8093 Zürich, Switzerland; 4: Magnel-Vandepitte Laboratory of Structural Engineering and Building Materials, Ghent University, Belgium; ukrainczyk@wib.tu-darmstadt.de
	3D-printed ultra-high-performance concrete with polymer fibers: feasibility study <u>Markovic, Ivan</u>; Reichlin, Thomas; Khodari, Nassim University of Applied Sciences of Eastern Switzerland, CH-8640 Rapperswil, Switzerland; ivan.markovic@ost.ch
11:00am - 12:30pm	MS26-3: Retrofitting, strengthening and strategies to extend the service live for concrete and masonry structures Location: BEY 127 Session Chair: David Sandmann Session Chair: Flávio de Andrade Silva Session Chair: Daniel Cardoso Session Chair: Juliane Wagner Session Chair: Alois Vorwagner Session Chair: Jan Berger 7th Session Chair: Preinstorfer, Philipp / TU Wien, AT Seismic retrofit of RC structures using hybrid SMA-stainless steel jackets <u>Ntina, Maria</u> National Technical University of Athens, Greece; mntina@mail.ntua.gr Self-centering SE-SMA core BRBs for seismic resilience <u>Guimaraes Rocha, Pedro</u>; Palermo, Dan York University, Canada; pedroagr@yorku.ca Effect of masonry infills on seismic retrofitting of existing RC frames with steel exoskeletons <u>Nigro, Francesco</u>¹; Della Corte, Gaetano²; Martinelli, Enzo¹ 1: University of Salerno, Italy; 2: University of Naples Federico II, Italy; fnigro@unisa.it Optimal design of retrofit interventions for existing RC frames through genetic algorithm <u>Nigro, Francesco</u>; Martinelli, Enzo University of Salerno, Italy; fnigro@unisa.it Fatigue tests on large-scale prestressed concrete beams with a dry ground joint <u>Shmorgun, Aleksei</u>¹; Schramm, Clara¹; Birkner, Dennis²; Marx, Steffen¹; Kang, Chongjie¹ 1: Dresden University of Technology, Germany; 2: Ramboll Deutschland GmbH, Germany; aleksei.shmorgun@tu-dresden.de Numerical investigation of a cushion-protected bridge girder subjected to hard-body impact <u>Mraihi, Haider</u>; Hashemi, Javad; Kalfat, Robin; AL-Mahaidi, Riadh Swinburne University of Technology, Australia; hmrail@swin.edu.au
11:00am - 12:30pm	MS27-1: Machine learning methodologies for structural health monitoring Location: BEY E40 Session Chair: Yunus Harmanci Session Chair: Panagiotis Martakis Uncertainty-aware prognosis using polynomial chaos expansion: insights from case studies <u>Georgijev, Viktor</u>¹; Bogoevska, Simona² 1: matrices engineering GmbH, Germany; 2: Faculty of Civil Engineering in Skopje, University of Ss. Cyril and Methodius, North Macedonia; georgijevviktor@gmail.com Residual PCA similarity for robust missing sensor prediction in Schwindegg Bridge <u>Mediel-Cuadra, Diego</u>; Wimmer, Johannes; Küttenbaum, Stefan; Braml, Thomas Institute for Structural Engineering, University of the Bundeswehr Munich, Germany; diego.mediel@unibw.de Machine learning-aided seasonal normalization of modal frequencies in timber buildings

	Entezami, Alireza¹; Amaddeo, Carmen²; Dorn, Michael²; Martinelli, Luca¹; Limongelli, Maria Pina¹ 1: Politecnico di Milano, Italy; 2: Linnaeus University, Sweden; mariagiuseppina.limongelli@polimi.it Machine learning-based prediction of wind-induced bridge acceleration using long-term structural health monitoring data Ramasetti, Eshwar Kumar; Neubauer, Alexander; Kähler, Phillip Technical University of Berlin, Germany; eshwar.kumar.ramasetti@tu-berlin.de Leveraging transfer learning for SHM: domain adaptation across Italian real bridges De Cicco, Benito; Longo, Monica; Darò, Paola; Mancini, Giuseppe Sacertis Ingegneria S.r.l., Italy; benito.decicco@sacertis.com Two-stage deep learning framework for bridge traffic characterization using DAS Wu, Chao-sheng; Fratta, Dante; Blum, Hannah; Hampton, Jesse University of Wisconsin Madison, United States of America; cwu377@wisc.edu
12:30pm - 2:00pm	Lunch break Location: Neue Mensa
2:00pm - 3:30pm	MS02-2: Innovative bonded solutions for steel structure repair and retrofit Location: BEY E17 Session Chair: Yvonne Ciupack Session Chair: Björn Abein Session Chair: Matthias Albiez Session Chair: Angelo Savio Calabrese Session Chair: Pierluigi Colombi Session Chair: Elyas Ghafoori 7th Session Chair: Stammen, Elisabeth / TU Braunschweig, DE TFC Booster – accelerated controlled CFRP curing process for rapid return to service MERCIER, Julien; HUYNH, Alain; LUCAS, Jean-Roch; SABIR, Najeeb Freyssinet, France; najeeb.sabir@freyssinet.com Experimental development of a self-sensing steel reinforced polymer system with fibre Bragg grating sensors De Santis, Stefano¹; Ricci, Maurizio¹; Vezzari, Valerio² 1: Roma Tre University, Italy; 2: Global Sensing Srl, Italy; stefano.desantis@uniroma3.it Memory-steel for fatigue strengthening of a steel bridge in Germany Jübner, Paul¹; Weiser, Robby²; Li, Lingzhen³; Wang, Sizhe⁴; Unglaub, Julian²; Thiele, Klaus²; Ghafoori, Elyas¹ 1: Leibniz University Hannover, Germany; 2: Technische Universität Braunschweig, Germany; 3: The Hong Kong Polytechnic University, Hong Kong, China; 4: Nanyang Technological University, Singapore; juebner@stahl.uni-hannover.de Shear performance of timber-steel hybrid beams: experimental investigation Haase, Peter¹; Aurand, Simon²; Boretzki, Jakob¹; Sandhaas, Carmen²; Albiez, Matthias¹; Dietsch, Philipp²; Ummenhofer, Thomas¹ 1: Steel and Lightweight Structures, Karlsruhe Institute of Technology, Germany; 2: Timber Structures and Building Construction, Karlsruhe Institute of Technology, Germany; peter.haase@kit.edu Strengthening cross-laminated timber with CFRP for structural reuse Darvish, Hesameddin^{1,2}; Botte, Wouter²; Wan-Wendner, Lin¹ 1: Department of Civil Engineering, KU Leuven, Sint-Katelijne-Waver, 2860, Belgium; 2: Department of Structural Engineering and Building Materials, Ghent University, Gent, 9052, Belgium; hesameddin.darvish@kuleuven.be Effect of mineral-bonded protective layers under impact loading Leicht, Lena; Unger, Nicholas; Schubert, Thomas; Beckmann, Birgit TUD Dresden University of Technology, Germany; lena.leicht@tu-dresden.de
2:00pm - 3:30pm	MS06-2: Monitoring, assessment and design of lightweight metal façades Location: BEY 245 Session Chair: Felicitas Räderl Session Chair: Zbigniew Pozorski Session Chair: Markus Kuhnhenne Monitoring-based hygrothermal evaluation of a hybrid timber-sandwich facade Schardt, Annalena; Räderl, Felicitas; Schmidt, Lilli; Ciupack, Yvonne TU Darmstadt, Germany; schardt@stahlbau.tu-darmstadt.de

	In-situ analysis of airtightness and hygrothermal properties for metal building envelopes Karbig, Nico; Kuhnhenne, Markus RWTH Aachen, Germany; nka@stb.rwth-aachen.de Air-coupled ultrasound driven Inline quality control of lightweight metal façades Haugwitz, Christoph¹; Ziermann, Yannick²; Schardt, Annalena³; Soenneken, Sören¹; Dörsam, Jan Helge¹; Wismath, Sonja¹; Reinartz, Andre²; Hahn-Jose, Thomas²; Rädcl, Felicitas³; Lange, Jörg³; Kupnik, Mario¹ 1: Measurement and Sensor Technology Group, Technische Universität Darmstadt, Darmstadt, Germany; 2: Inoson GmbH, St. Ingbert, Germany; 3: Steel Construction, Technische Universität Darmstadt, Darmstadt, Germany; christoph.haugwitz@tu-darmstadt.de Aging processes and lifecycle monitoring of polyurethane sandwich panels Steineck, Sonja; Rädcl, Felicitas; Schardt, Annalena; Lange, Jörg; Ciupack, Yvonne Technical University of Darmstadt, Germany; raedel@stahlbau.tu-darmstadt.de Assessment of existing sandwich panel façades for reuse and retrofit Rädcl, Felicitas; Pradhan, Eric Man; Sivakadacham, Anusikah; Lange, Jörg; Ciupack, Yvonne TU Darmstadt, Germany; raedel@stahlbau.tu-darmstadt.de Parametrized life cycle assessment of modular construction systems Weniger, Alexandra¹; Gomes, Carlos G.²; Traverso, Marzia¹; Chudoba, Rostislav³ 1: Institute of Sustainability in Civil Engineering, RWTH Aachen University; 2: Institute of Structural Concrete, RWTH Aachen University; 3: Center for Structural Concrete Physics, RWTH Aachen; alexandra.weniger@inab.rwth-aachen.de
2:00pm - 3:30pm	MS12-1: Advanced fatigue assessment and life design of steel structures Location: POT 112 Session Chair: Helen Bartsch Session Chair: Antti Ahola Rethinking renewal: sufficiency strategies for historic steel railway bridges in the German railway network of Deutsche Bahn Schulte, Clara Jiva BTU Cottbus-Senftenberg, Germany; Clara.jiva.schulte@gmail.com Fatigue strength of circular hollow section tube-to-gusset plate detail with extended welds Lipiäinen, Kalle; Grönlund, Kiia; Ahola, Antti LUT University, Finland; antti.ahola@lut.fi Fatigue strength properties of a connection subjected to far-field compressive stresses Leander, John; Skoglund, Oskar KTH Royal Institute of Technology, Sweden; john.leander@byv.kth.se Effect of weld imperfections on the fatigue strength of single-sided butt-welded connections Mouradian, Kevin^{1,2}; Beyer, André¹; Couchaux, Maël² 1: Centre Technique Industriel de la Construction Métallique, 91190 Saint-Aubin, France; 2: Institut National des Sciences Appliquées de Rennes, 35700 Rennes, France; kmouradian@cticm.com Fatigue strength of cold-formed high-strength steel hollow sections – a fracture mechanical assessment on the imperfection effects Ahola, Antti¹; Lipiäinen, Kalle¹; Skriko, Tuomas²; Tulonen, Juha³; Hyvärinen, Anssi³; Ikkala, Juha³ 1: Steel Structures, LUT University, Yliopistonkatu 34, FI-53850 Lappeenranta, Finland; 2: Welding Technology, LUT University, Yliopistonkatu 34, FI-53850 Lappeenranta, Finland; 3: SSAB Europe Oy, Harvialantie 420, FI-13300 Hämeenlinna, Finland; antti.ahola@lut.fi Crack propagation in welded specimens with biaxial non-correlated loading Steinhoff, Simon¹; Röscher, Stefanie²; Winkler, Rebekka¹; Knobloch, Markus² 1: Ruhr-University Bochum, Germany; 2: University of Stuttgart, Germany; simon.steinhoff@rub.de
2:00pm - 3:30pm	MS16-2: Carbon-negative compression dominant structures for decarbonized and deconstructable concrete buildings

Location: **BEY 117**
 Session Chair: **Saim Raza**
 Session Chair: **Moslem Shahverdi**
 Session Chair: **Stijn Matthys**

Shape stability investigation for 3D printed carbon-curing concrete objects using visual inspection methods

Farahani, Adeleh; Misiarz, Karol; Ooms, Ticho; Van Tittelboom, Kim; Aelterman, Jan; Matthys, Stijn
 Ghent University, Belgium; adeleh.farahani@ugent.be

An integrated geometry slicing & 3D scanning framework for 3D concrete printing

Bhooshan, Vishu¹; Lin, Wo¹; Hanlon, Justin¹; Bhooshan, Shajay¹; Megens, Johannes²; Sanin, Sandro²; Dell'Endice, Alessandro³; Van Mele, Tom³; Block, Philippe³
 1: Zaha Hadid Architects, United Kingdom; 2: Incremental3D, Innsbruck, Austria; 3: Block Research Group (BRG), ETH Zurich, Switzerland; Vishu.Bhooshan@zaha-hadid.com

A design optimization framework for discrete compression-dominant structures

Sakha, Mahsa¹; Raza, Saim¹; Czaderski, Christoph¹; Shahverdi, Moslem^{1,2}
 1: Empa, Swiss Federal Laboratories for Materials Science and Technology, Dübendorf 8600, Switzerland; 2: School of Civil Engineering, University of Tehran, Tehran 4563-11155, Iran; mahsa.sakha@empa.ch

Sensor-integrated masonry systems for predictive monitoring and circular construction

Florenzano, Daniele; **Dell'Endice, Alessandro**; Van Mele, Tom; Block, Philippe
 ETH Zürich, Switzerland; dellendice@arch.ethz.ch

Parametric design and life cycle assessment of slab bridges for Swiss road infrastructure with reduced CO2 emissions

Harmanci, Yunus Emre¹; Kramer, Lukas¹; Mohammadi, Amirhossein²; Serra, Martina³; Hischier, Roland³; Wyrzykowski, Mateusz¹; Shahverdi, Moslem¹; Steiger, René¹
 1: Empa, Swiss Federal Laboratories for Materials Science and Technology, Dübendorf, 8600, Switzerland; 2: University of Minho, ISE Department of Civil Engineering, Guimarães, 4800-058, Portugal; 3: Empa, Swiss Federal Laboratories for Materials Science and Technology, St. Gallen, 9014, Switzerland; yunus.harmanci@empa.ch

LCA of bridge and tunnel components – basis for sustainable infrastructure

Schiessl-Pecka, Angelika¹; **Steinmetz, Paul**¹; Rausch, Anne¹; Zintel, Marc²
 1: Ingenieurbüro Schiessl Gehlen Sodeikat GmbH, Germany; 2: Steeltec AG, Switzerland; steinmetz@ib-schiessl.de

2:00pm - 3:30pm

MS18/19-1: Advances in monitoring, assessment and rehabilitation of timber structures

Location: **POT 51**
 Session Chair: **Robert Jockwer**
 Session Chair: **Mike Sieder**
 Session Chair: **Pedro Palma**
 Session Chair: **Elena Perria**
 Session Chair: **Maria Loebjinski**

Development of the new Eurocode 5 part on assessment of existing timber structures

Jockwer, Robert¹; Loebjinski, Maria²; Sieder, Mike²; Rug, Wolfgang³
 1: TUD Dresden University of Technology, Germany; 2: TU Braunschweig, Germany; 3: Hochschule für nachhaltige Entwicklung Eberswalde HNEE, Eberswalde, Germany; robert.jockwer@tu-dresden.de

Preliminary visual assessment of historic timber structures in Georgia

Kambek, Erkan¹; Papiashvili, Nutsa²; Potkhishvili, Gvantsa³
 1: Istinye University, Türkiye; 2: Heritage Conservation Laboratory, Georgia; 3: Heritage Conservation Laboratory, Georgia; erkankambek@kambek.com

Prediction of mechanical timber properties – experimental investigation and updating

Gehling, Luca; Loebjinski, Maria; Grobe, Jan; Perria, Elena; Sieder, Mike
 Technische Universität Braunschweig, Germany; luca.gehling1@tu-braunschweig.de

Combination of NDT for assessment of timber beam stiffness in view of reusability

Vandecruys, Eline¹; Detremmerie, Xander²; Lombaert, Geert¹; Caspeelee, Robby²; **Verstrynghe, Els**¹
 1: KU Leuven, Belgium; 2: Ghent University, Belgium; els.verstrynghe@kuleuven.be

	Non-destructive assessment of hybrid CLT Borghese, Vittoria; Vonk, Niels; Niederwestberg, Jan Netherlands Organisation for Applied Scientific Research (TNO), Molengraaffsingel 8, Delft, 2629 JD, The Netherlands; vittoria.borghese@tno.nl Enhancing CT accuracy of historic timber via LTI-SIRT with velocity compensation Borghese, Vittoria¹; Xuewei, Ling²; Demartino, Cristoforo³; Dongdong, Chen² 1: Netherlands Organisation for Applied Scientific Research (TNO), Molengraaffsingel 8, Delft, 2629 JD, The Netherlands; 2: College of Civil Engineering, Nanjing Forestry University, Nanjing, Jiangsu, 210037, P.R. China; 3: Department of Architecture, Roma Tre University, Largo Giovanni Battista Marzi 10, Rome, 00153, Italy; vittoria.borghese@tno.nl
2:00pm - 3:30pm	MS23-1: Considering defects and damage effects on the safety of civil engineering structures Location: BEY 127 Session Chair: Matthias J. Rebhan Session Chair: André Arnold Session Chair: Franz Tschuchnigg Session Chair: Dirk Schlicke Info4Infra - including geotechnical and structural information into the inspection process Glatz, Sandra¹; Lienbacher, Lukas²; Grubinger, Stefan³; Kammersberger, Andreas⁴; Schlicke, Dirk²; Rebhan, Matthias J.¹ 1: Graz University of Technology - Institute of Soil Mechanics, Foundation Engineering and Computational Geotechnics, Austria; 2: Graz University of Technology - Institute of Structural Concrete, Austria; 3: recordIT GmbH, Austria; 4: Styrian Government, Austria; sandra.glatz@tugraz.at Real-time damage annotation and damage development using 3D inspection models Grubinger, Stefan¹; Kalenjuk, Slaven²; Kammersberger, Andreas³; Dobrezberger, Johann⁴ 1: recordIT GmbH, Austria; 2: Land Vorarlberg, Austria; 3: Amt der Steiermärkischen Landesregierung, A 16 Verkehr und Landeshochbau, Austria; 4: IBZ Geotechnik GmbH, Austria; grubinger@recordit.at Advancing structural diagnostics: computed tomography of a full-scale historical building component Pahn, Matthias; deSousa, Christoph; Siebecker, Klaus RPTU Kaiserslautern-Landau, Germany; matthias.pahn@rptu.de Sensitivity analysis of a peridynamic model for alkali-activated materials based on μ-CT-derived pore structure Wang, Tongfang^{1,2}; Wang, Chao²; Tu, Yongming¹; Sas, Gabriel² 1: Southeast University; 2: Luleå University of Technology; chao.wang@ltu.se Static characterization and damage localization in prestressed concrete beams Shamsaddinlou, Amir¹; De Domenico, Dario¹; La Mazza, Dario²; Longo, Monica²; Maugeri, Natale¹; Longo, Paolo¹; Messina, Davide¹; Recupero, Antonino¹; Mancini, Giuseppe² 1: University of Messina, Villaggio S. Agata, Contrada Di Dio, Messina 98166, Italy; 2: Sacertis Ingegneria S.R.L., C.so M. D'Azeglio 118, Turin 10126, Italy; amir.shamsaddinlou@studenti.unime.it Multi-sensor detection of controlled prestress release in an existing continuous post-tensioned bridge Agredo-Chavez, Angelica¹; Colmenares, Daniel²; Gonzalez-Libreros, Jaime¹; Wang, Chao¹; Sas, Gabriel¹ 1: Luleå University of Technology, Sweden; 2: Dewesoft, Sweden; angelica.agredo@ltu.se
2:00pm - 3:30pm	MS27-2: Machine learning methodologies for structural health monitoring Location: BEY E40 Session Chair: Yunus Harmanci Session Chair: Panagiotis Martakis Graph neural networks for structural damage detection on the Hell Bridge Test Arena Concha Avila, Carlos; Marasco, Giulia; Azizinamini, Atorod Florida International University, United States of America; gmarasco@fiu.edu Machine-learning-based damage detection in beam-column connections using modal features Javadzadegan, Mohammadreza¹; Shamsaddinlou, Amir²; Shirgir, Sina³; De Domenico, Dario² 1: Azarbaijan Shahid Madani University, Iran; 2: University of Messina, Italy; 3: University of Tabriz, Iran; amir.shamsaddinlou@studenti.unime.it

	Damage identification of bridge girders using limited strain data and stacked machine learning Vafaei, Mohammadreza¹; C Alih, Sophia²; Naseem Yousif, Allban Eevyan¹ 1: Universiti Teknologi Malaysia, Malaysia; 2: Institute of Noise and Vibration, Universiti Teknologi Malaysia, Malaysia; vafaei@utm.my
	Automated seismic damage assessment using limited strain data and machine learning Vafaei, Mohammadreza¹; C Alih, Sophia²; Zhong Yi, Sam¹ 1: Faculty of Civil Engineering, Universiti Teknologi Malaysia, Malaysia; 2: Institute of Noise and Vibration, Faculty of Civil Engineering, Universiti Teknologi Malaysia, Malaysia; vafaei@utm.my
	Vibration-based assessment of a historic railway bridge using convolutional autoencoder networks Pirro', Marco; Gentile, Carmelo Politecnico di Milano, Italy; marco.pirro@polimi.it
	Deep learning-based structural health monitoring for CFRP-strengthened RC slabs Özekin, Hasan¹; Harmanci, Yunus² 1: Bilkent University, Türkiye; 2: Empa, Switzerland; hasan.ozekin@ug.bilkent.edu.tr
3:30pm - 4:00pm	Coffee break Location: Exhibition and Catering Rooms: BEY E39, E26, 126
4:00pm - 5:30pm	MS09: Monitoring of structural health, noise and vibration of urban transportation infrastructure, and its assessment planning Location: BEY E17 Session Chair: Duo Liu Monitoring of Tramway Superstructures using Short- and Long-term Measurements Liu, Jia; Uzar, Kazim TU Darmstadt, Germany; jliu@vwb.tu-darmstadt.de Railway track irregularity estimation based on sleeper acceleration and Kalman filter (KF) method Han, Xiaodong¹; Li, Shaoguang²; Cheng, Liangliang¹ 1: University of groningen, Netherlands, The; 2: RailTechnology GmbH, Germany; clint.han@rug.nl Inspection of rail roughness with acoustic based vehicle side measurement Unger, Martin; Liu, Duo Chair of Railway Track Engineering, Dresden University of Technology, Germany; martin.unger@mailbox.tu-dresden.de Experimental Validation of a Drive-By Bridge Monitoring Algorithm Ereiz, Suzana^{1,2}; Limonelli, Marina Pina¹; Malekjafarian, Abdollah³; Duvnjak, Ivan² 1: Politecnico di Milano, Department of Architecture, Built Environment and Construction Engineering, Piazza Leonardo da Vinci, 32, Milano 20133, Italy; 2: University of Zagreb Faculty of Civil Engineering, Fra Andrije Kačića-Miošića 26 Zagreb, 10000, Croatia; 3: Structural Dynamics and Assessment Laboratory, School of Civil Engineering, University College Dublin, Newstead, Belfield, Dublin 4, Ireland; suzana.ereiz@polimi.it SmartPontem – Overload detection on structures via embedded instrumentation Brossard, Baptiste; Mercier, Julien; Najeeb, Sabir Freyssinet France, France; baptiste.brossard@freyssinet.com, najeeb.sabir@freyssinet.com A large-scale experimental setup for cyclically loaded soils beneath road pavements Ullmann, Sebastian; Uhlig, Markus; Kahnt, Maximilian; Herle, Ivo Institute of Geotechnical Engineering, TU Dresden, Germany; sebastian_pierre.ullmann@tu-dresden.de
4:00pm - 5:30pm	MS12-2: Advanced fatigue assessment and life design of steel structures Location: POT 112 Session Chair: Helen Bartsch Session Chair: Antti Ahola Fatigue limit estimation of WAAM specimens using temperature-based load increase tests Heydarinouri, Hossein¹; Canclini, Severin²; Gilliar-Schönenberger, Lionel Arthur²; Mohri, Maryam¹; Silvestru, Vlad-Alexandru²; Affolter, Christian¹; Leinenbach, Christian^{1,3}

1: Empa, Swiss Federal Laboratories for Materials Science and Technology, Überlandstrasse 129, 8600 Dübendorf, Switzerland; 2: ETH Zurich, Swiss Federal Institute of Technology Zurich, Stefano-Francini-Platz 5, 8093 Zurich, Switzerland; 3: EPFL, Swiss Federal Institute of Technology Lausanne, CH-1015 Lausanne, Switzerland; hossein.heydarinouri@empa.ch

Consideration of residual stresses in fatigue verification of 60 E2 rails

Will, Elias^{1,2}; **Wenner, Marc**³; **Marx, Steffen**^{1,2}; **Kang, Chongjie**^{1,2}

1: Institut of Concrete Structures, TUD Dresden University of Technology, Georg-Bähr-Straße 1, Dresden 01069, Germany; 2: Cluster of Excellence CARE, TU Dresden and RWTH Aachen, Germany; 3: MKP GmbH, Zum Hospitalgraben 2, 99425 Weimar, Germany; elias.will@tu-dresden.de

Dealing with fatigue cracks in steel components

Knoedel, Peter¹; **Gkatzogiannis, Stefanos**²; **Hörenbaum, Christoph**³

1: Dr Knoedel Engineering Consultants, 76530 Baden-Baden, Germany; 2: Institute of Steel Structures, NTUA, Zografou Campus, 15772, Athens, Greece; 3: IPU Ingenieurgesellschaft Karlsruhe mbH, 76185 Karlsruhe, Germany; info@peterknoedel.de

Increasing residual lifetime of steel structures through use of nanometallic multilayer treatment

Rutner, Marcus

Hamburg University of Technology, Germany; marcus.rutner@tuhh.de

Optimization of composite bridge design using high-frequency mechanical impact: a case study

Al-Karawi, Hassan; **Al-Emrani, Mohammad**; **Dagduk, Saffa**; **englund, cecilia**; **Öst, Mattias**

COWI-AB, Denmark; HSAK@COWI.COM

A monitoring concept for grouted connections: state of the art and application to the FINO3 research platform

Sievers, Tilman Johannes^{1,2}; **Reichling, Kenji**²; **Rozsar, Peter**²; **Goertz, Stephan**²

1: Forschungs- und Entwicklungszentrum Fachhochschule Kiel GmbH; 2: Kiel University of Applied Sciences; tilman.sievers@haw-kiel.de

4:00pm - 5:30pm

MS18/19-2: Advances in monitoring, assessment and rehabilitation of timber structures

Location: **POT 51**

Session Chair: **Robert Jockwer**

Session Chair: **Mike Sieder**

Session Chair: **Pedro Palma**

Session Chair: **Elena Perria**

Session Chair: **Maria Loebjinski**

Hygro-mechanical response of a timber canopy: integrating SHM data and FEM simulations

Shahsavar, Sadra; **Knoops, Ine**; **Dragan, Dan**; **Gouveia Henriques, Jose**; **Vandoren, Bram**; **Vereecken, Eline**

Hasselt University, Belgium; sadra.shahsavar@uhasselt.be

Can pre-war vernacular houses in the Ore Mountains offer a good indoor microclimate?

Výšková, Dominika; **Bošová, Daniela**

Faculty of Architecture - Czech Technical University in Prague, Czech Republic;

dominika.vyskova@cvut.cz

Comprehensive assessment and static analysis enabling rehabilitation through compensatory measures alone: a case study

Perria, Elena; **Sieder, Mike**

Technische Universität Braunschweig, Germany; e.perria@tu-braunschweig.de

Museum of local history Sternberg: a holistic rehabilitation of the historic building substance

Meisel, Andreas¹; **Schlichting, Björn**¹; **Mägde, Christian**¹; **Loebjinski, Maria**^{1,2}

1: WKC Hamburg GmbH; 2: Technische Universität Braunschweig, Germany; m.loebjinski@tu-braunschweig.de

Re-use of timber piles with the application of CFRP

Heithorn, Jendrik; **Fouad, Nabil A.**

Leibniz Universität Hannover, Germany; heithorn@ifbp.uni-hannover.de

	Investigation of recoverability of prestressed self-centering rocking timber columns Chen, Xi; Zhang, Rui; Leng, Yubing; Zhang, Fuwen; Wang, Mingqian; Chen, Lingzhu; Xu, Qingfeng Shanghai Key Laboratory of Engineering Structure Safety, Shanghai Research Institute of Building Sciences Co. Ltd, China, People's Republic of; chenxi@sribs.com
4:00pm - 5:30pm	MS23-2: Considering defects and damage effects on the safety of civil engineering structures Location: BEY 127 Session Chair: Matthias J. Rebhan Session Chair: André Arnold Session Chair: Franz Tschuchnigg Session Chair: Dirk Schlicke Condition assessment and structural behavior of prototype bridge deck slabs Khan, Asad-Ur-Rehman¹; Mahmood, Wajeeha²; khalid, Fatima¹; Fareed, Shamsoon¹ 1: NED University of Engineering & Technology, Pakistan; 2: National Consulting Office for Engineering, UAE; asadkhan@neduet.edu.pk Effect of defects on stress concentration factors in pipes under bending Wang, Jiahao¹; Subhani, Mahbube²; Zhang, Peng¹; Gong, Jinzhe¹ 1: Deakin University, Waurn Ponds, VIC 3216, Australia; 2: Chalmers University of Technology, Göteborg, SE-412 96, Sweden; s223572786@deakin.edu.au, mahbube@chalmers.se, peng.neo.zhang@deakin.edu.au, james.gong@deakin.edu.au Durability and corrosion of micropiles: insights from a multi-year field study Arnold, André¹; Angst, Ueli²; Brem, Martin³; Marti, Benjamin⁴; Portmann, Gregor¹ 1: HSLU - Lucerne University of Applied Sciences and Arts, Switzerland; 2: ETH Zurich, Institute for Building Materials, Switzerland; 3: SGK - Swiss Society for Corrosion Protection, Switzerland; 4: BS Zeier AG, Switzerland; andre.arnold@hslu.ch Damaged anchored structures: geotechnical and structural assessment using numerical analysis Daxer, Hans-Peter¹; Ober, Julia²; Rebhan, Matthias J.¹; Leo, Johannes¹; Schlicke, Dirk²; Tschuchnigg, Franz¹ 1: Graz University of Technology, Institute of Soil Mechanics, Foundation Engineering and Computational Geotechnics, Graz, Austria; 2: Graz University of Technology, Institute of Structural Concrete, Graz, Austria; rebhan@tugraz.at Condition assessment and rehabilitation ageing large concrete water reservoirs: South African case studies MAIDI, Marcia Retlogetswe¹; MAKAMA, Lebogang²; MATHABATHA, Trevor³ 1: Rand Water, South Africa; 2: Rand Water, South Africa; 3: Rand Water, South Africa; MMAIDI@RANDWATER.CO.ZA Secant stiffness and failure modes of EBF frames using castellated beams Parung, Herman¹; Sandy, Desi²; Sangle, Pebrinar Riani²; Rachmansyah, Rachmansyah³ 1: Universitas Hasanuddin, Indonesia; 2: Paulus Indonesia Christian University, Indonesia; 3: UKRIDA - Krida Wacana Christian University, Indonesia; parungherman@yahoo.co.id
4:00pm - 5:30pm	MS27-3: Machine learning methodologies for structural health monitoring Location: BEY E40 Session Chair: Yunus Harmanci Session Chair: Panagiotis Martakis Satellite-based, territorial-scale screening and maintenance prioritization of river-crossing bridges via interferometry Civera, Marco¹; Miano, Andrea²; Hamzaoui, Yassir¹; Vera, Costantini³; Paolo, Mazzanti^{3,4}; Francesco, Fabbrocino²; Andrea, Prota⁵; Bernardino, Chiaia¹ 1: Politecnico di Torino, Italy; 2: Pegaso University, Italy; 3: NHAZCA S.r.l., Italy; 4: Sapienza University, Italy; 5: University of Naples Federico II, Italy; ANDREA.MIANO@UNIEGASO.IT A deep learning and ray casting framework for bridge inspection Fonseca, João¹; Jorge, Tomás¹; Soares, Eduardo¹; Magalhães, Jorge¹; Cabral, Rafael^{1,2}; Lima, Bernardino³; Santos, Ricardo^{1,2}; Ribeiro, Diogo^{1,2} 1: iBuilt, ISEP, Polytechnic Institute of Porto, Portugal; 2: CONSTRUCT, FEUP, University of Porto, Portugal; 3: Techonis – Global Consulting Services, Porto, Portugal; jpdf@isep.ipp.pt SLAM-based drone inspection and damage detection for underground rainwater

	tunnels <u>Lee, Changjun</u>¹; Choi, Woonggyu¹; Kim, Inhi²; Park, Seunghee¹ 1: Sungkyunkwan University, Republic of Korea; 2: Korea Advanced Institute of Science and Technology, Republic of Korea; russe14447@skku.edu Pi-MFLNet: a DFL-based raster-scan MFL imaging system for structural monitoring <u>YIGZEW, FITSUM EMAGNENEHE</u>¹; Kim, Hansun²; Park, Seunghee³ 1: Sungkyunkwan University, Korea, Republic of (South Korea); 2: Sungkyunkwan University, Korea, Republic of (South Korea); 3: Sungkyunkwan University, Korea, Republic of (South Korea); fitsebahrn@gmail.com A semantic workflow linking image-based concrete damage segmentation to ontology-driven knowledge graphs for digital twin integration and automated structural diagnostics <u>Dalvi, Vedant Girish</u>; Fröhlich, Daniel; Preidel, Cornelius; Dauberschmidt, Christoph Hochschule München, Germany; vedant_girish.dalvi@hm.edu Synthetic data generation for visual damage recognition of aging bridge structures using 3D engine-based simulation <u>Choi, Woonggyu</u>¹; Lee, Changjun¹; Bak, Jinyeong¹; Jang, Kitae²; Park, Seunghee¹ 1: Sungkyunkwan University, Republic of Korea; 2: Korea Advanced Institute of Science and Technology, Republic of Korea; toco717@skku.edu
4:00pm - 5:30pm	MS31: Wave-based monitoring techniques for structural engineering Location: BEY 117 Session Chair: Kilian Tschoeke Session Chair: Lars Schubert Session Chair: Max Fiedler Non-destructive wave-based detection of delamination in corroded RC panels <u>Vandecruys, Eline</u>; Vanquaille, Andras; <u>Verstrynge, Els</u> KU Leuven, Belgium; els.verstrynge@kuleuven.be Non-destructive measurements for assessing concrete material in underwater conditions <u>Lippold, Lukas</u>; Reichert, Ina; Bonitz, Frank Materialforschungs- und -prüfanstalt Weimar, Germany; Lukas.lippold@mfpa.de Field application of acoustic emission during load testing of existing reinforced concrete bridge <u>Zhang, Fengqiao</u>¹; Kortendijk, Coen²; Besseling, Floris²; Yang, Yuguang¹ 1: Delft University of Technology, Netherlands, The; 2: Witteveen+bos, Netherlands, The; F.Zhang-5@tudelft.nl Acoustic digital twin for prestressed concrete bridges <u>Zaripova, Gulshat</u>¹; Brinkman, Nienke²; Marty, Patrick²; Pirsawetz, Stephan¹; Boehm, Christian²; Trattinig, Horst³; Gebraad, Lars² 1: Bundesamt für Materialforschung und -prüfung (BAM), Germany; 2: Mondaic AG; 3: Vallen Systeme GmbH, Germany; gulshat.zaripova@bam.de Machine learning for wire break detection <u>Göbel, Philipp</u>; Fiedler, Max; Jansen, Andreas MKP GmbH, Germany; philipp.goebel@marxkrontal.com Acoustic emission monitoring of fatigue damage in a transition piece of a wind turbine tower <u>Pirskawetz, Stephan</u>¹; Thiele, Marc¹; Löhr, Manuel²; Liao, Chun-Man¹; Degener, Sebastian¹; Herrmann, Ralf¹ 1: BAM, Germany; 2: Vallen Systeme GmbH; stephan.pirskawetz@bam.de
4:00pm - 5:30pm	PS2: Digital methods for structural assessment Location: BEY 245 Session Chair: Francesca Marsili How effective are LLM-designed optimizers for multilevel thresholding of concrete defects? <u>Jafariasl, Jafar</u>¹; Konstantis, Spyridon²; Papastamos, George³; Spyridis, Panagiotis¹ 1: University of Rostock, Germany; 2: Director, Ruler Consult Ltd, London, UK; 3: CEO, Moniterra Group,

Copenhagen, Denmark; jafar.jafariasl@uni-rostock.de

Digital volume correlation applied to in-situ tomography data of a hollow core beam

Liebold, Frank¹; Zierul, Lore²; Grzesiak, Szymon³; Pahn, Matthias³; Beckmann, Birgit²; Maas, Hans-Gerd¹

1: Institute of Photogrammetry and Remote Sensing, TUD Dresden University of Technology;

2: Institute of Concrete Structures, TUD Dresden University of Technology; 3: Rheinland-Pfälzische Technische Universität Kaiserslautern-Landau (RPTU); frank.liebold@tu-dresden.de

Assessment of historic cast steel bearings

Burkart, Andreas¹; Döbereiner, Benedikt²; Langenberg, Peter²; Mensinger, Martin³

1: Mensinger Stadler Ingenieure; 2: IWT Solutions AG; 3: Technische Universität München;

burkart@mensing-stadler.de

Maintenance and monitoring for the conservation of industrial steel buildings: a review

Francavilla, Antonella Bianca; Miano, Andrea; Pireneo, Gianmarco; Olivieri, Carlo; Fabbrocino, Francesco

Pegaso University, Italy; andrea.miano@unipegaso.it

A rapid post-earthquake loss assessment system for open-pit mines in Taiwan

Lin, Chi-Hao¹; Hsu, Hsi-Chieh²; Lin, Fan-Ru¹; Huang, Lee-Hui¹; Lu, Xue-Min¹; Lin, Che-Min¹; Chai, Juin-Fu¹; Chen, Kuo-Ching³

1: National Center for Research on Earthquake Engineering, NATIONAL INSTITUTES OF APPLIED RESEARCH, Taiwan; 2: GEOLOGICAL SURVEY and MINING MANAGEMENT AGENCY, MINISTRY of ECONOMIC AFFAIRS; 3: Institute of Applied Mechanics, National Taiwan University; chihao@nlar.org.tw

Prediction of unified strain ductility in FRP-confined concrete column using machine learning

Win, Sandar¹; Shayanfar, Javad²; Nguyen, Hoang¹; Rezazadeh, Mohammadali¹

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